

# COAL AGE

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**O**NE-SIXTH the area of France has been devastated. The territory destroyed included the richest districts in the country. Approximately 350,000 French homes were utterly ruined. From 70 to 90 per cent. of France's steel, sugar and weaving industries no longer exist. The machinery has either been demolished or carried away. One-fifteenth of the population of the Republic is dead or missing.

France must be restored. So must other areas that have suffered the ravages of war. Rapidity of execution is the primary consideration in this matter of reconstruction. Almost everything is needed, and in large quantities. Where can the necessary supplies be obtained most readily?

The United States Army has on hand enough lumber to build 100,000 small houses. It has millions of dollars' worth of plumbing, heating, water-supply and sanitary fixtures. It has bakeries that will produce 2,000,000 loaves of bread daily. From the demolition of war plants America will be able to salvage astounding quantities of useful material and equipment.

What is more sensible than that the United States dispose of these supplies in the regions desolated by war. Setting aside all impulses of human sympathy, there are material reasons for such action. Practically all supplies have but a limited ability to resist rust and corrosion, and it is commonly agreed that to sell such materials now in our domestic market would seriously curtail the Nation's normal production at a moment when we are trying to find employment for 5,000,000 soldiers and munition workers.

We are building a great merchant marine. To fill these ships we must secure foreign markets. Such work is slow and expensive. Here we have a chance to satisfy our humanitarian ideals, establish a foreign trade and help overcome the danger of a domestic labor panic. It is not important that we be paid for these things immediately. The debts Europe already

owes us cannot be settled unless America proceeds at once to make France, Belgium, Serbia and Russia self-supporting. The chief security for our loans is the recuperative power of the Allies. The food we send them only makes the debt larger. It is the acres of land and factories we restore for production that enhances our security and hastens repayment.

Let us say to France right now: "Here is the material for reconstruction, and if you say the word, we will also furnish you an unexcelled engineering organization to start the work while your people are

getting on their feet once again." If we will do this, there will be no doubt in Europe as to our sincerity in the matter of international agreements that will forever end war.

America faced war unitedly. Let us not face peace irresolutely. Already in our midst we hear the prophets of woe. Theorists talk of bread lines and panics that will accompany the deflation of our industries. Our practical men who deal in facts know better.

They are aware that industry can slow down if skillfully managed, without disturbing the relation of wages and cost of living.

The workman must now think of increasing his individual production, and the employer will not have to think of decreasing wages. Let us grow up to inflation by establishing new profits which labor can share. The world's needs were undersupplied before the war, and now with the coming of peace we are minus the labor of 15,000,000 workmen, killed or disabled. It will be a generation before the common wants of humanity can be supplied on a pre-war basis.

We must talk more of increasing production and less of liquidating wages. America occupies a new place in the world. The cure for domestic inflation is foreign trade. We have a splendid chance to begin our expansion right now.

This is a time of opportunity, not of crisis.

## Is it Opportunity OR Crisis?

BY FLOYD W. PARSONS

# Changes in Beehive Coke Oven Construction Due to Mechanical Operation

BY GEORGE W. HARRIS  
Editorial Staff, *Coal Age*



FIG. 1. PULLING COKE AND FORKING IT BY HAND

THE Yankee is reputed to be one of the laziest of fellows. At least such a statement about his countrymen was said to have been made by the late George Westinghouse, at a dinner given in his honor in London, England, a number of years ago. The further comment was offered, by way of explanation, that if the Yankee was given a piece of work to perform involving hard manual labor, he lost little time in devising some mechanical device that would do the work for him.

Numerous instances are on record of devices that have supplanted almost entirely the human element in industrial operations. A striking case of this kind is at hand in connection with coke plants. For many years coke has been drawn from beehive coke ovens and forked onto cars by hand. It has been such a familiar sight that it requires no special comment (see Fig. 1). The physical effort of drawing coke from an oven with the ordinary coke puller is not excessive in itself, but the discomfort caused by the heat from the oven and the recently quenched coke adds greatly to the labor of this operation during hot weather. However, it takes considerable time to draw an oven by hand and the oven is losing valuable heat during the operation.

There is always an incentive to supplant hand labor by a mechanical device that will do the same work quicker and cheaper. The advantages of such an

arrangement are most apparent during strikes or at times of labor scarcity. It is of added benefit to a plant to be able to accomplish with a few men and a machine what would ordinarily require several times the ordinary labor force to do by hand. Also, by drawing an oven by mechanical means coke costs are reduced and the output of the oven increased. Probably such considerations as these largely influenced and hastened the working out of a mechanical coke-drawing and loading machine.

The most extensively used machine of this type—the Covington, made by the Covington Machine Co., of Covington, Va.—is shown in Figs. 2 and 3 operating at a beehive coke plant of the H. C. Frick Coke Co. This machine consists of two principal parts, an extractor for drawing the coke out of the ovens and a conveyor for screening and loading it into cars. The steel ram used to extract the coke is carried in a swinging carriage so as to reach either side of the oven. These mechanical features of the Covington are the result of a gradual growth, the necessary changes being made in the ovens as modifications of the old beehive type became desirable.

The type of mechanical extractor used, and its action, brought about changes in oven door width, the oven brick liners, door jambs and coke yard details. The old oven door was too narrow to permit of operating the ram to best advantage, so it was widened

to a width of about 42 in. or more. The brick in the lower course of liners, which frequently received the impact of the ram of the coke extractor, were found to be rather light to withstand the hard usage they received and accordingly were made larger and heavier. Similarly, the door jambs were modified to better meet the new requirements imposed upon them. Substantial construction is required in the lowest jamb to resist the wearing action of the ram bar in its travel in and out of the oven.

The changes noted were the essential ones, and were brought about by failure of the oven parts under the more severe service of the mechanical extractor over that of the old hand coke puller. Such parts simply needed to be made heavier, of different shape or of other material. When the new method of coke extraction was thoroughly established other changes were made in old ovens, as repairs or renewals permitted their adoption with little additional expense. When new coke plants were contemplated further modifications were possible; these greatly reduced the cost of

the plant and at the same time permitted the same or an increased efficiency in oven operation. Among such improvements is the abandonment of the wide, elevated coke yard with its retaining wall and the lowering of the oven itself in the same proportion.

The accompanying illustrations bring out these points. In Fig. 4 is shown a cross-section of a typical old-time beehive block, or double row, coke-oven plant with its elevated ovens and yards necessitating considerable dry wall for oven foundation and yard retaining walls. Contrast the old type with the machine-operated plant shown in cross-section in Fig. 2. One of the most apparent and striking changes is the lowering of the whole plant. Cut off some 7 to 8 ft. of the lower part of the oven foundations and yard in the plant shown in Fig. 4, and the new type as illustrated in Fig. 2 will be had.

New machine oven plants can be constructed flat on the ground—no high foundations for ovens are necessary, no yard retaining walls are required and little filling. The grades for the yard and machine tracks

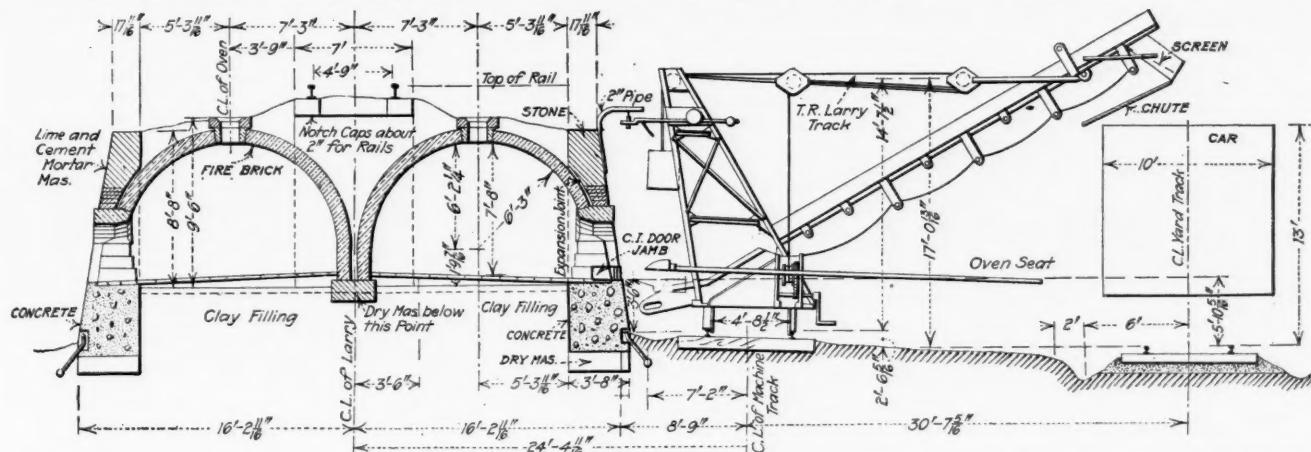


FIG. 2. CROSS-SECTION OF BLOCK COKE OVEN ADAPTED TO MACHINE OPERATION—COKE-DRAWING AND LOADING MACHINE SHOWN IN POSITION

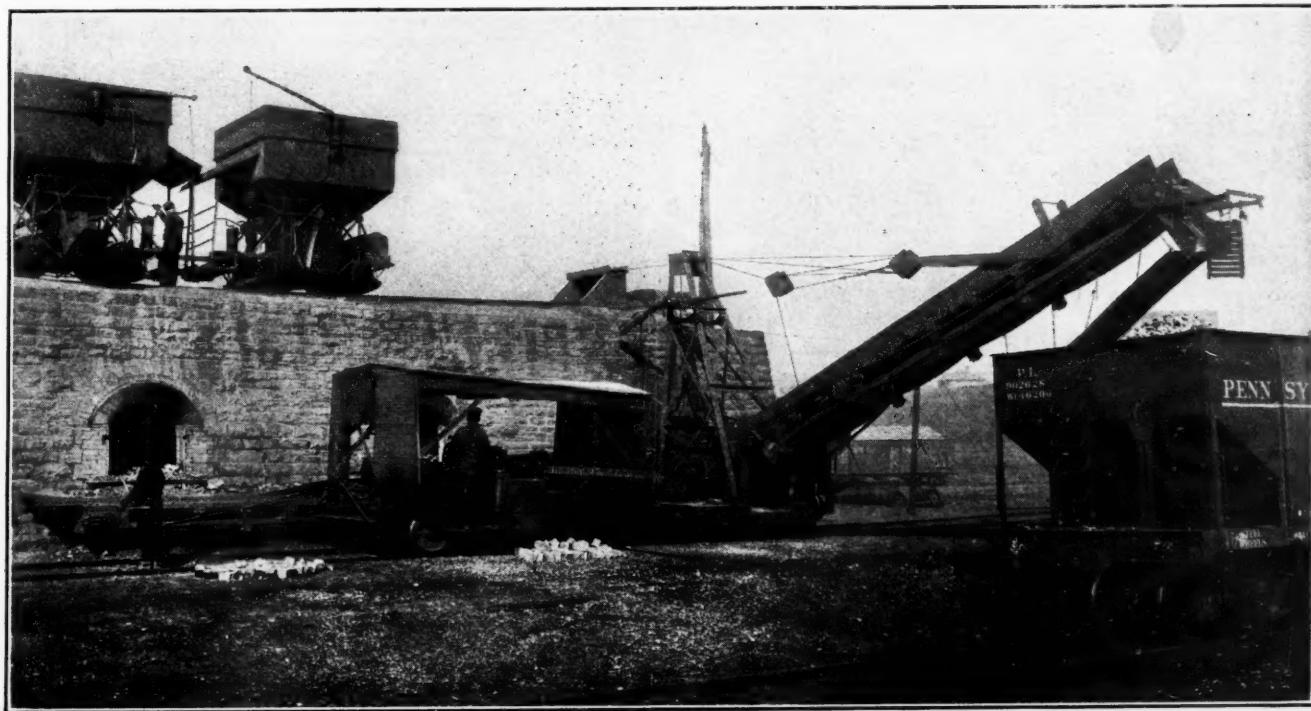


FIG. 3. COVINGTON COKE-DRAWING AND LOADING MACHINE OPERATING AT A PLANT OF THE FRICK COKE CO. IN WESTERN PENNSYLVANIA

are practically on the same level. Furthermore, the height of the bottom of the oven above the machine track has been reduced; the old height was 3 ft. 6 in., now it can be 2 ft. 7½ in. This lower oven represents quite a saving in cost of construction. Attention is also directed to the distance of the yard track from the coke oven; this is practically fixed by the length of the coke-loading apparatus and is a minimum distance. Some old coke yards are twice

new ovens of this type are being constructed by the Frick company) concrete is used in the front wall from a point 6 in. below the yard level to the oven seat. From the oven seat to the top of the wall mortar masonry is used, the mortar being composed of sand, lime and cement. The proportion of lime and cement varies somewhat in the different parts of the wall. On the portion of the wall over the door, where the greatest heat is encountered, about one-third cement and two-

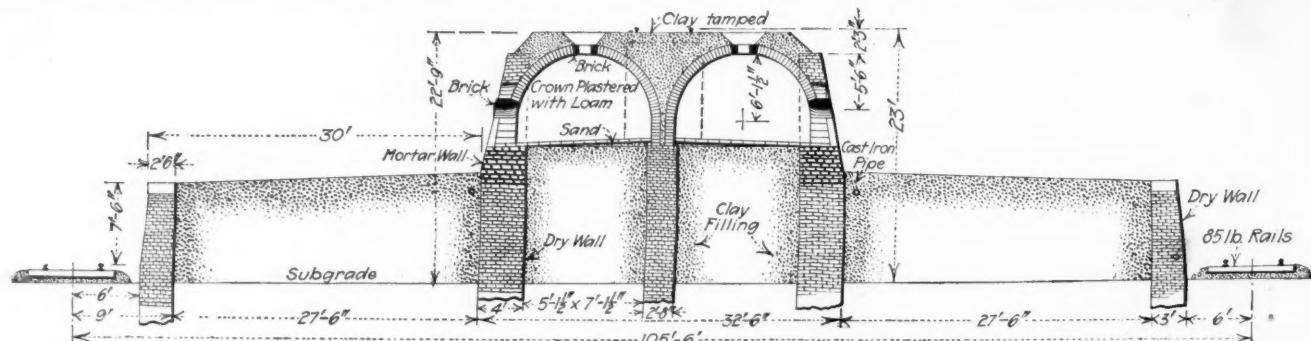


FIG. 4. CROSS-SECTION OF OLD-TYPE BLOCK BEEHIVE COKE OVENS, OPERATED BY HAND

the width of those shown in Figs. 2 and 3. In the machine-operated oven yard, storage room for coke is not a consideration; generally the coke is on cars for shipment before it has entirely lost its heat.

The largest beehive coke-oven operator in the country is the H. C. Frick Coke Co., of western Pennsylvania, a subsidiary of the United States Steel Corporation.

thirds lime are used; but in the rest of the wall about equal proportions of lime and cement are employed.

There has been no change in the Frick method of constructing the foundations or in the plan of tamping clay filling under the ovens. Neither has there been any change in the method of constructing the ring dry-wall under the ovens in either the bank or the block

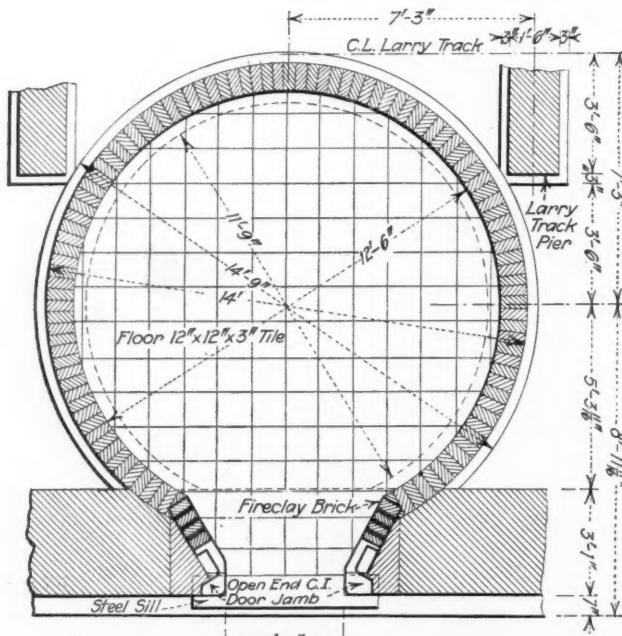


FIG. 5. PLAN OF COKE OVEN SHOWING FRICK JAMB DETAILS

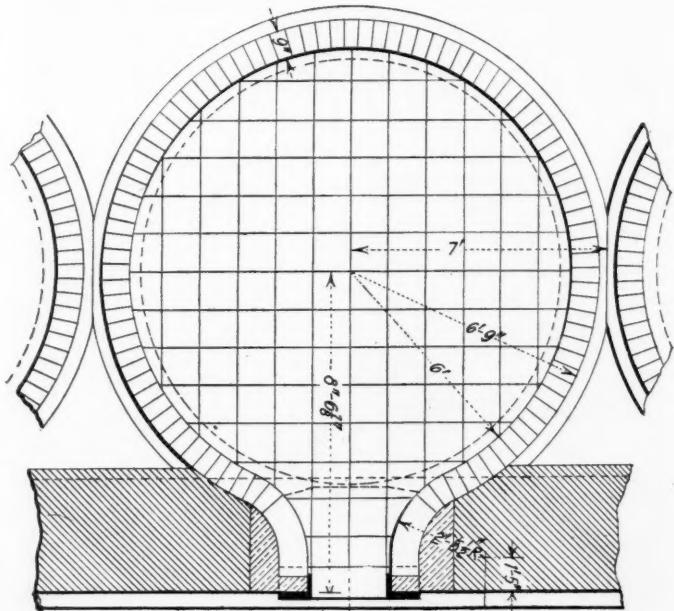


FIG. 6. PLAN OF TYPICAL, HAND-DRAWN BEEHIVE COKE OVEN

This company operates some 19,000 ovens and has installed over 80 Covington machines at its coke plants. Furthermore, the methods used by this concern are of more than ordinary interest to those operating beehive ovens, as the practice of the Frick people today represents the mature judgment of many years of experience in coke manufacture. In Figs. 5 to 10 inclusive are shown details of the present Frick method of construction for machine-drawn ovens. Where this company is rebuilding or repairing its old ovens (no

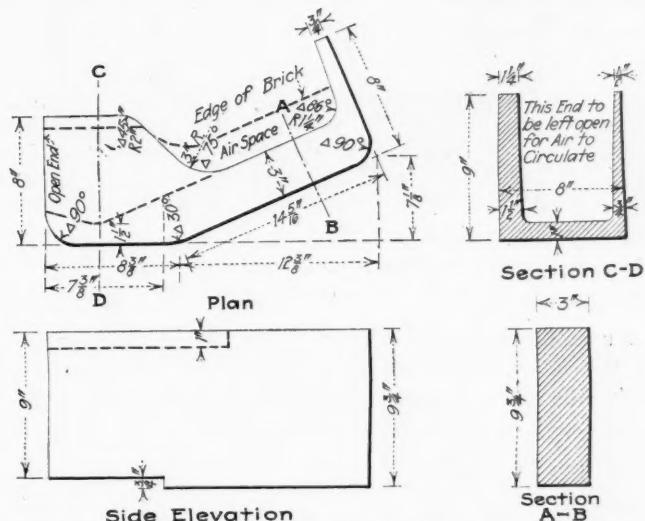
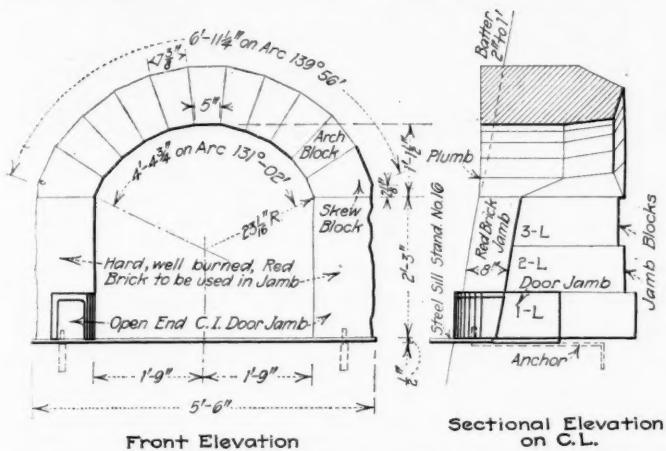
type. Dry-wall is used for the foundation to a point within 6 in. of the brick wall, the top 6 in. of this wall being constructed of mortar masonry.

Due to the abrasion of the coke and extractor bar on the lowest jamb, the Frick people are now replacing this jamb with an open-end cast-iron jamb, as indicated in Figs. 5, 7, and 9, and as shown in detail in Fig. 8. The cast-iron jamb has an open outer end in order that there may be a free passage of cool air back of the metal exposed to the greatest heat from the oven.

On account of excessive wear on the bottom courses of the ordinary lining brick, these are now being replaced with lining-blocks 9 in. high and 21 in. long; they are heavier than the usual liners and are not so subject to damage when accidentally struck by the scraper head of the machine.

In connection with the straight jambs on either side and directly back of the oven door there is an interesting bit of history, which is best told in the words of G. W. Greenwood, treasurer of the United Refractories Co., of Uniontown, Penn.: "Little did I imagine one day in the summer of 1909, as I answered the telephone, the consequences which would follow the conversation.

warranted to shoot around the corner. So it was asked if the plan of the oven could be modified to allow direct access to all parts of it. At the same time there was the necessity of preserving the bottle-neck shape of the front opening on account of the arch which covers it. Accordingly, a representative of the United Refractories Co. and the superintendent who brought up the subject together worked out a compromise by which the opening at the floor of the oven is like that shown in Fig. 5, while at the base of the arch which covers

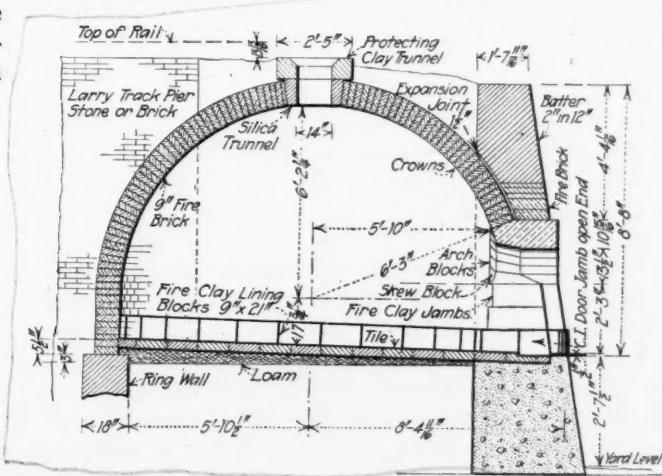
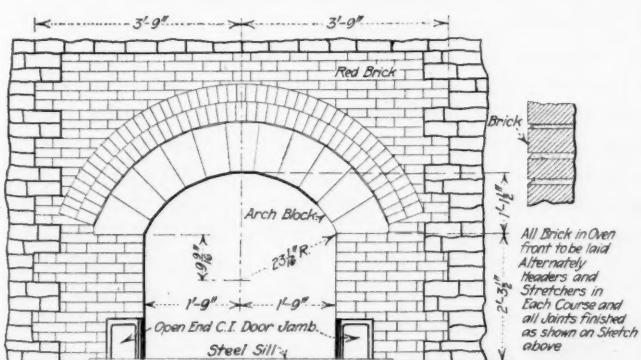


FIGS. 7 AND 8. ELEVATION AND SECTION OF STANDARD FRICK BEEHIVE DOORWAY FOR MACHINE-OPERATED OVEN AND STANDARD CAST-IRON DOOR JAMB

The call was from a wide-awake, progressive superintendent of a coke plant not far from Uniontown, who wished to discuss with someone the possibility of making brick and shapes which would simplify the drawing of coke by machines. Now, in the original type of beehive coke oven—a hemispherical dome with an opening at the top for the escape of fire and smoke—there is also a short entrance arched over, like the passageway into an Esquimo's snow-built home. The plan

the opening a horizontal section of the oven resembles Fig. 6.

"The arch is supported on each side by jamb blocks, which up to 1909 or 1910 had always been made with a curved face. The plan worked out was to use one or more straight jambs for the lower course or courses



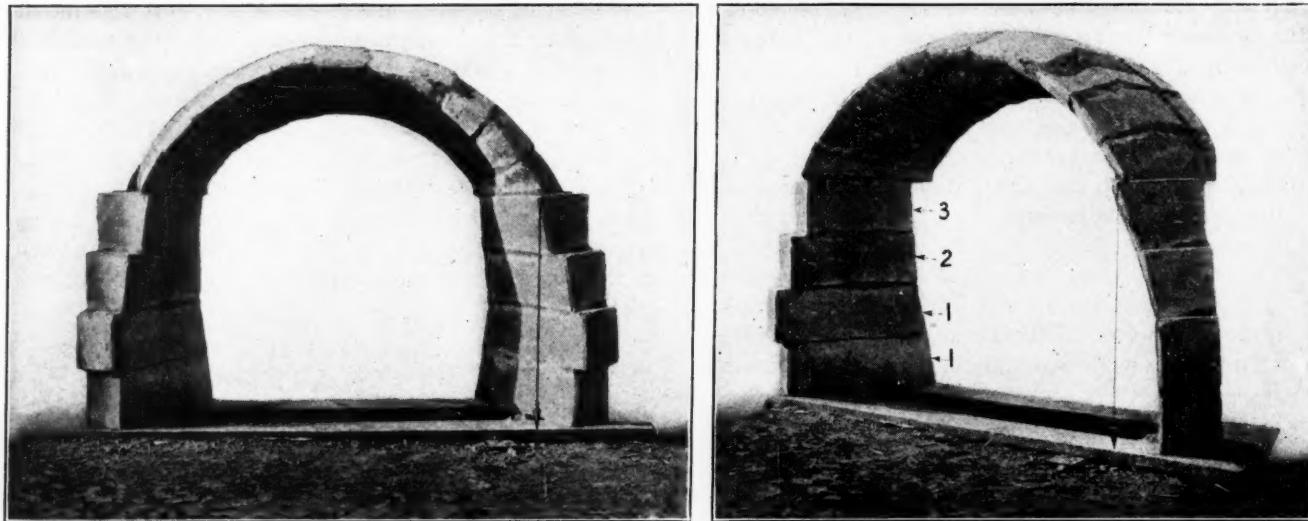
FIGS. 9 AND 10. DETAILS OF OVEN FRONT AND DOORWAY AND SECTION THROUGH STANDARD FRICK OVEN

at the floor of the oven is somewhat like the bottle-shaped opening shown in Fig. 6.

"It will readily be seen that the coke on each side of the door cannot be drawn so readily, as it has to be pulled around the corner formed by the reverse curve. So long as the drawing was done by hand, this difficulty apparently received little consideration. But with the introduction of machines, it was found impracticable to clean out the oven completely, the scraper of the coke-drawing machine not being like the gun which was

on each side of the doorway; the next course of jambs being straight on the lower edge and the face developing so that the upper edge was slightly curved. Next the top course of jambs began with the flare of the course immediately below, at the top having a more decided flare, conforming to the base of the arch and making a firm support for it.

"The success of the plan was apparent from the start. The height to the base of the arch (springing line of the arch) is either 29 in. where three jambs



FIGS. 11 AND 12. SETS OF JAMBS AND ARCHES ERECTED IN THE OPEN TO FORM A DOORWAY  
Fig. 11—View of doorway from a point in the oven and directly behind the arch. Fig. 12—View of doorway from a point in the rear and to the right, looking obliquely through the doorway

are used on each side or 38 in. in the case of four jambs. In the latter case two No. 1 jambs are first used on each side (being superimposed), each jamb being approximately 9 in. in height; the odd 2 in. in the total height being supplied by the skews. The arches are placed on the top pair of jambs so that they project about 9 in. in front of the top jambs. These details are shown in Figs. 7 and 9. The front overhang of the end of the arch brick is to permit the use of red brick on either side of the door, as shown in Fig. 7. The width of the oven door determines the position of the front ends of the jambs; they are swung as far apart as necessary in the back to fit in with the liners of the ring wall of the ovens. The divergence in each particular case is determined by the diameter of the oven and the length of the neck. This construction tends to eliminate the inaccessible pockets on either side of the oven.

"In Fig. 11 the arrangement of the jambs and arch bricks (erected in the open) is shown as viewed from the standpoint of a person in an oven looking out through the doorway from a position directly behind the arch. A plumb-bob is shown suspended from the base of the arch to the ground; from the position of the bob one can see how the top jamb overhangs like a precipice. Also, it can be seen in Fig. 12 that there is a beeline from the feet of the observer right through the lowest jamb on the right of the doorway. This view was taken from the rear, and to the right, looking obliquely through the doorway, so as to show the overhanging (side overhang) No. 2 and No. 3 jambs.

"Recently there has arisen the feeling that all the advantages in drawing coke should not be reserved for the machines. It is felt that where the drawing is done by hand, the men should also have a straight pull and not be obliged to draw coke around the corner. As a result the so-called straight jambs for machine ovens are being used also for hand-drawn ovens, the only difference being that they are set closer together on account of the narrower door. These jambs have been favorably received in the field, particularly by large operators in the western Pennsylvania region."

The business-like precision of mechanically operated

coke plants catches the eye of a person visiting the works of progressive coke men. The yards of such plants at times may even suggest a temporary cessation of work, as the business of drawing and charging ovens is attended to with dispatch and such operations may be completed by noon, giving an air of idleness to the plants. It has been said, "It looks like Sunday at the ovens." The darky coke puller is fast disappearing too. He may still be a picturesque sight in the eyes of some, but not to the practical coke manufacturer of today. Officials of the Frick Coke Co. and the United Refractories Co. (leading sources of such information) furnished the data, photographs and prints for this article.

### Reservation of Superior Coking Coal Is Considered by British Committee

In the report of the Carbonization Committee of Great Britain special note is made of certain seams of coal in the celebrated Durham field of England, which have been exported as steam coal; this coal is particularly adapted to the manufacture of coke, forming a fine, hard coke, low in ash and sulphur. The report states that these seams should be reserved exclusively for this purpose and on no account should the export of this particular quality of coal be permitted; the export of coals capable of producing a good quality of metallurgical coke must of necessity in time be a disadvantage to the expansion and economy of the iron and steel trade of Great Britain.

An increased foreign demand for the best coking coals is predicted by the Committee in the near future as some of the countries which produce relatively small quantities of iron and steel are making plans for increasing their output and coke ovens will be included in their schemes. Even if it is found upon investigation that there is a sufficiently large reserve of coking coals to meet the needs of the increasing home iron and steel industry, nevertheless every effort should be made to export any surplus available for such purposes, as metallurgical coke; it should be exported in that form in order to retain the valuable byproducts at home.

## Some Tests with Flow Meters

BY JOSEPH A. MAGUIRE  
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**SYNOPSIS**—In order to increase plant efficiency actual facts must be known. The flow meter furnishes means for readily obtaining the actual consumption or output of a steam generating or consuming apparatus. The tests here described resulted in the elimination of wastes that were unsuspected.

PRESENT world conditions, necessitating conservation of all resources, have brought to a deserved prominence many pieces of apparatus heretofore incorrectly looked upon as luxuries. Some years ago the flow meter was in this class, but of late power plants in all industries have been straining to their utmost in an

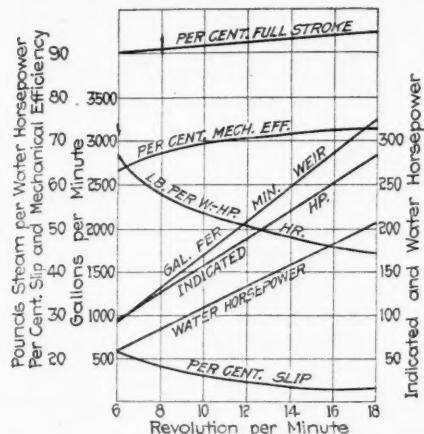


FIG. 1. CHARACTERISTIC CURVE OF DUPLEX COMPOUND CONDENSING PUMP

Steam end, 19 x 36 x 36 in.; water end, 21 x 36 in.; head, 248 ft.; suction, 10 ft.; steam pressure, 125-140 lb.; Scranton jet condenser vacuum, 22-24 in. Steam curve includes losses in 1460 ft. of 8 in. main and 68 ft. of 5 in. main

endeavor to raise efficiencies and, consequently, the real value of this device has been gradually realized.

A considerable amount of prominence has been given to the use of the flow meter in boiler rooms of manufacturing industries, central stations, etc., but its application to mine power plants is practically an untouched subject. The present article is an account of operations in this field.

A short time ago a number of collieries operating 36 boiler and power plants were thoroughly investigated by their owners and engineers. These men had foreseen the coming coal shortage and were preparing to meet it not only through increased production but by conservation in their own plants. Flow meters were installed as a means of obtaining the required information.

The testing equipment, at the start, consisted of four Type F flow meters, the necessary mechanisms and an assortment of nozzle plugs and pipe reducers. Later eight more meters of the same kind were added.

After a preliminary survey of the entire layout it was evident that the pumping situation was the most serious and needed immediate attention. The first

pumping plant investigated, located 250 ft. underground, consisted of four simple duplex direct-acting non-condensing pumps, each of 2000 gal. per minute rated capacity, and two duplex compound condensing pumps, each of 4000 gal. per minute capacity. The condensing pumps were equipped with low vacuum jet condensers. These six pumps were located in three adjoining pump-rooms, two of which were partially submerged during periods of high water.

Steam was supplied from a modern boiler plant on the surface, at a distance of 2500 ft. The steam main was a 10-in. pipe for a distance of 600 ft., then branching to two 8-in. mains to the pumps. Bypass connections at the pumps allowed any set of pumps to be operated from either 8-in. line, and connections at the foot of the bore-hole, where the 10-in. pipe branched, allowed either 8-in. pipe to be supplied from an old boiler plant.

It was decided that the required information could best be obtained by determining the characteristic curves of the various pumps separately and in combination. For this purpose three meters were installed on the steam lines to the pumps. A double end contracted weir was built on the surface to measure the discharge of the pumps, and engine indicators were used to determine the indicated horsepower, mean effective pressure, length of stroke, etc.

One of the three meters was connected on the surface to the 10-in. steam line. The other two were located inside the mines, on the 8-in. lines, 1600 ft. from the pumps. Each instrument had a calorimeter and recording pressure gage connected nearby. In order to meet accurately the wide range of flow necessary for the tests, one of the meters inside was connected to two nozzle plugs, one an 8-in. and the other an 8 x 5½-in. reducer.

In order to get the meters installed it was necessary

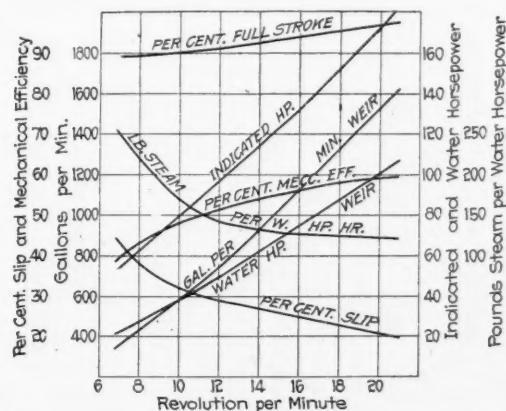


FIG. 2. CHARACTERISTIC CURVE OF DUPLEX NON-CONDENSING PUMP

Steam end, 24 x 36 in.; water end, 14 x 36 in.; head, 254 ft.; suction, 6 ft.; steam pressure, 125-134 lb.

to load them in mine cars, lower them down a slope to a gangway, haul them by mule to the airway where they were to be installed and finally carry them to the points chosen for their location. There the meters were unpacked, assembled and adjusted.

The accompanying curves are some of those taken during this investigation. Fig. 1 was taken from tests

on a duplex compound condensing pump and Fig. 2 from a test on a duplex noncondensing pump. These tests, it should be borne in mind, were taken after the pumps had been installed several years. The steam consumption curves also include condensation losses in pipe, etc. The tests were made with the steam lines and pumps in the condition in which they were found and as ordinarily operated. They were in fairly good repair.

An analysis of the curves showed several important facts. The difference in steam consumption per water-horsepower between the compound condensing pumps and the simple noncondensing pumps was particularly noticeable. It was, of course, recognized that one type was more efficient than the other, but the large difference in economy was more easily seen by obtaining definite figures under similar operating conditions. This one item has been of much value in numerous other pumping installations, since it emphasized the facts in a way that no estimated figures have been able to do.

Another point demonstrated by the test was the lack of capacity of the pumps. The condensing pumps were rated at 4000 gal. per minute at 22 r.p.m., but they could not be safely operated above 3000 gal. per minute. Their best operating capacity from a standpoint of repairs and upkeep was at 1700 to 2000 gal. per minute, while their best efficiency was obtained at about 3500 to 4000 gal. per minute, a rating at which they could not be operated. This not only explained the difficulty experienced in caring for floods but also showed a wastage of about 3000 tons of coal per year due to the necessity of using the noncondensing pumps even in low-water periods.

As a result of these tests two 2500 gal. per minute electrically driven centrifugal pumps have been installed and have effected a fuel saving of about 4500 tons of coal per year. In addition, and of equal importance, is the fact that production is not now curtailed during periods of high water.

It might be interesting to note that the totals of the

two inside flow meters checked within 2 per cent. of the meter on the outside 10-in. main.

After the foregoing tests had been completed a series of boiler and power-plant tests were carried out. The primary purpose of these trials was to determine power costs, boiler-plant efficiencies and, in the case of the generating plants, efficiency from coal pile to switchboard.

The size of the boiler plants varied from 1500 to 4000 hp. and the electric plants from 1400 to 3000 kw.-a. For these tests, platform scales were used for weighing the coal. Flow meters were installed on individual boilers and on the distributing steam mains. Other equipment included feed water flow meters, draft gages, recording pressure gages, flue gas thermometers, Orsat analyzer, electrical instruments, etc. The plant tests were of one week duration. Individual boiler tests of 25 hours were made, checking a flow meter against the feed water measured in calibrated tanks.

#### TYPES OF BOILERS THAT UNDERWENT TESTS

The types of boilers tested were horizontal return tubular B. & W., Stirling and Wickes. The furnaces were of the Dutch oven type, with sloping 18 per cent. air space dumping grates. Steam jet blowers furnished forced draft in the smaller plants and engine-driven fans in the larger ones. The fuel was a mixture of No. 1 buckwheat and birdseye anthracite containing 10 per cent. moisture and 15 per cent ash. The conditions, from a metering standpoint, were often difficult because of low velocity and pulsating flow. Nevertheless, the average error was seldom over 2 per cent. and in only one instance 10 per cent.

From the standpoint of the engineers and helpers making the test the conditions were equally trying. Boiler-room temperatures varied from 125 deg. F. down to 10 deg. Meters on steam mains, although filled with a strong alcohol solution, frequently froze. Those mounted on boilers did actually freeze occasionally, and at times draft gage and Orsat readings were only pos-

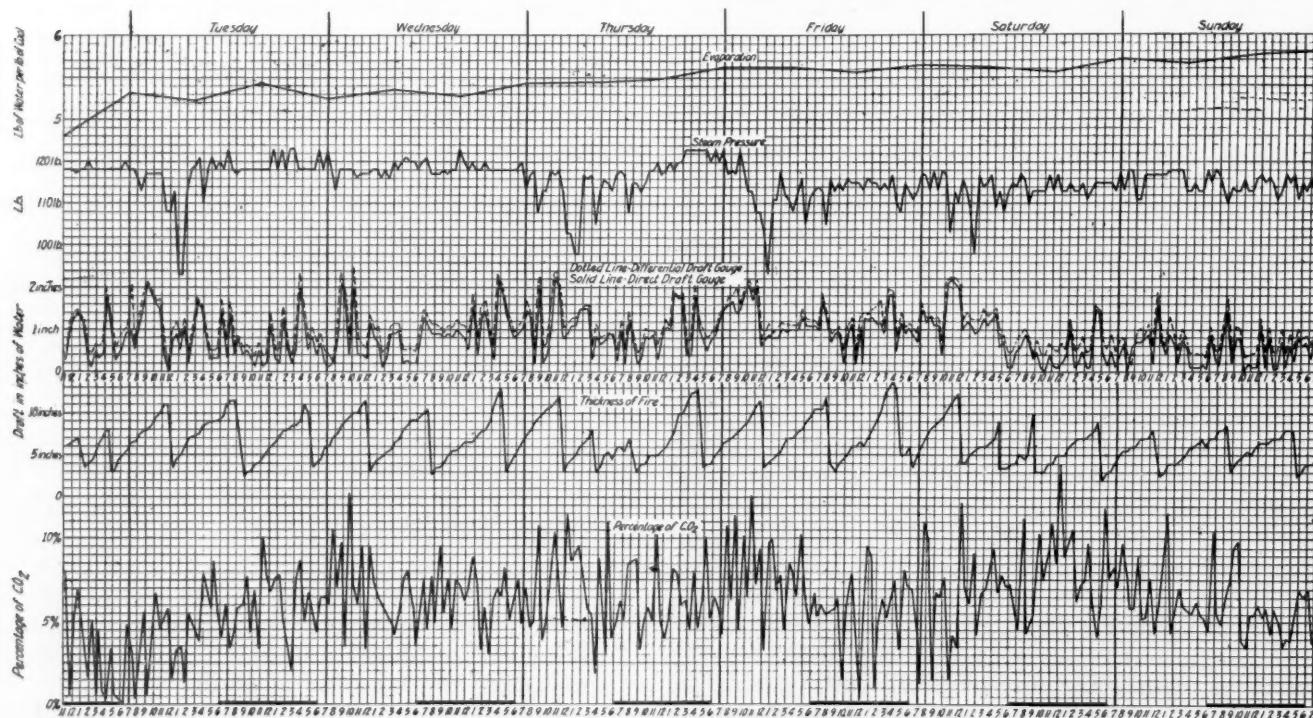


FIG. 3. EVAPORATION OF ONE BOILER FROM READINGS TAKEN IN A SIX-DAY TEST

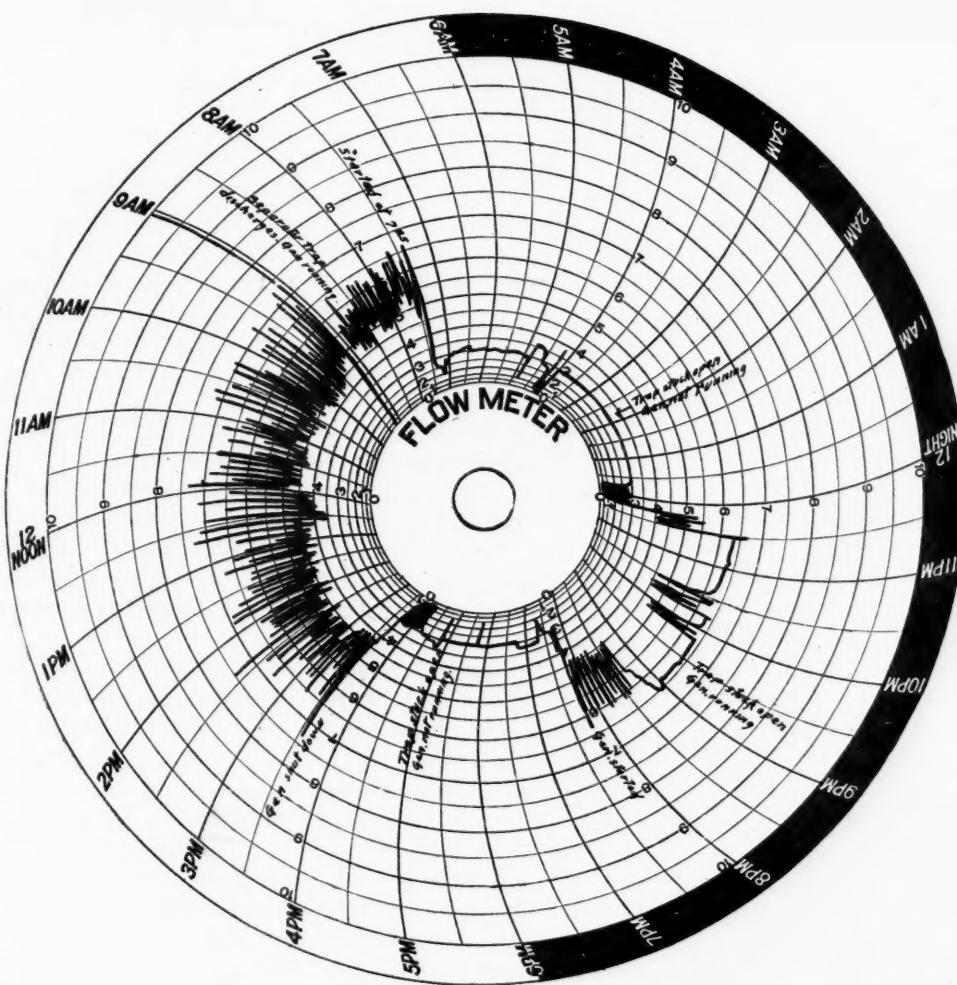


FIG. 4. A 24-HOUR FLOW METER CHART

sible by building fires on old grate bars directly under the instruments.

Power costs and distribution ratios were determined from the flow meters. The boiler units showed a general lack of capacity and a low efficiency; an average of 125 per cent. rating was the best the most modern plants could develop.

The curves shown in Fig. 3 indicate the evaporation of one boiler plotted from readings taken during a plant test of six days. The boiler was a 270-hp. Stirling. The test was made without instruction or otherwise interfering with the usual operation of the plant, the object being to obtain, as nearly as possible, the usual operating conditions.

In view of the extreme care taken to secure normal operating conditions, the rise in the evaporation curve from 4.8 lb. of water per pound of coal as fired to 5.8 at the end of the test is of interest. This curve gives an excellent illustration of the value of checking results. The increase in evaporation was due entirely to the firemen bettering their efforts as they realized they were being investigated.

Fig. 4 shows a flow meter chart taken in one of these tests. The meter was placed on the line supplying a 300-kw. compound noncondensing Corliss engine driving an alternator. The high momentary demand lines with the engine shut down and with it running should be noted. An investigation disclosed the fact that the trap on the boiler-room header was out of order. The water from the header had been going to the engine separator

and was thence discharged by the trap, causing the lines on the chart referred to above. It showed also that the separator traps frequently stuck open, allowing a steam wastage of 100,000 lb. per 24 hours. Repairing the traps remedied this trouble.

In addition to disclosing a condition that might have wrecked the engines eventually, had the separator traps failed to open, it was figured that the stopping of steam waste would pay for all the meters in one month's operation. After the results of these tests had been fully tabulated and analyzed, certain recommendations were made to the owners, one of which was the replacement of 15,000 sq.ft. of grate surface by new grates of smaller air space and the addition of 10 mechanical stokers. The 2500-kv.-a. mixed pressure turbines will also be installed later.

The foregoing tests, and the benefits which will accrue from them in the way of increased efficiency and fuel saving, represent a phase of

engineering work in which the flow meter finds its rightful place. In many power plants there are actions going on or equipment improperly functioning which will finally make themselves evident; but in many of the cases these discoveries are made only after considerable damage has been done. It is in such instances that these meters prove themselves a valuable aid.

### Peat Plays Important Part in Relieving Coal Shortage in France

Coal substitutes are being used in France, owing to the fuel shortage. Among such substitutes peat offers large inducements for exploitation; it is found over large areas of France. Mixtures of peat with other fuels have proved satisfactory. In one instance a mixture of six tons of fresh peat, one ton of sawdust and one ton of coal dust and factory waste was tried. A binder of wet peat is added in the mixing machine and the resulting briquets are left to dry until they contain no more than 30 per cent. moisture.

These peat briquets are used in France for firing boilers. At one locality trials with varying proportions of peat and coal have been conducted on a large scale, the maximum amount of peat so used being 90 per cent., the proportion depending somewhat on the amount of moisture in the peat. Investigations are also being carried on at the present time looking to the feasibility of utilizing peat as fuel for gas producers, and for supplying gas for gas engines.

## Coal Crushing Installation at an Illinois Mine

By W. G. KIMBALL  
Staunton, Ill.

When it became necessary to increase the crushing capacity at No. 2 mine of the Mt. Olive and Staunton Coal Co., at Staunton, Ill., the experience gained from the first crusher installation was utilized. This showed the following points were desirable, if not absolutely necessary, for a successful coal-mine crushing plant:

1. That the change from normal loading to crushing, and back, be simple and quick; that only lump sizes of coal be fed to the crusher; that the flow of coal be regular; and that it be possible to instantly stop this flow.
2. That the crusher and coal-handling machinery should be able to handle, without damage to itself, props and ties and other foreign material such as lifting jacks and rail plates.
3. That the discharge pit and other places liable to



SURFACE PLANT OF MT. OLIVE AND STAUNTON COMPANY collect quantities of coal should be capable of easy cleaning.

4. That the machinery be as free as possible from liability to breakdowns and consist of standard parts capable of repair at the mine shop, or easily obtainable from any supply house stocks; and that the power supply be continuous.

The new crusher was accordingly located at the end of the shaker screen, being fed by an extension from the main screen, receiving its motion from it when the connecting-rods are in place. To make this connection requires from  $\frac{1}{2}$ - to 2-min. stop of the main hoist. This is all the time that is necessary to change from normal loading to crushing or *vice versa*.

An American ring coal crusher was chosen as fulfilling the crushing requirements and indicating a low cost for maintaining the crushing surfaces. A 125-hp. General Electric motor was direct-connected by flexible coupling to the crusher, both being mounted on a structural iron subframe, built 10 ft. wide, in order to span the belt pit.

Despite the large ground space required by a belt conveyor and the high cost of the frame structure, the belt conveyor was chosen in preference to a bucket

elevator, as the belt only required a pit 5 ft. deep against 13 ft. for the elevator. Furthermore, the belt could handle a mine prop without damage to itself. A 42-in. Stevenson-Adamson belt conveyor was accordingly installed on a heavy frame made by the American Bridge Company.

The railroad car-loading chute is arranged so that a bar screen may be installed, allowing separation of the crushed product into nut and slack. The nut will be carried by a second conveyor across the slack-loading track to a nut-loading track. This has not yet been found necessary, as the normal supply of nut coal obtained from the tipple is sufficient. This was not true when crushing mine-run coal.

A 100-kw. generator is arranged to run the crusher and elevator motors on a circuit entirely separate from the rest of the mine, thus reducing the chance of losing the power and filling the crusher pit and crusher with coal. With the former installation, this form of accident sometimes required four hours to clean up—the spaces being so small that all the coal had to be moved with the hands.

While the crushing apparatus is in operation a man stationed at the side of the feeder shaker watches for foreign matter in the coal. He has the shaker-engine control wire at hand and stops the shaker in case of trouble, or on signal from the yard.

As it was not feasible or considered necessary to construct a hopper to allow car changing, and as it is bad practice to stop the belt under load, only the shaker feed is stopped. This makes it necessary for the yard foreman to give the stop signal about half a minute before his car is filled out, and the start signal as much later as he judges the change will take. It is interesting to note the precision with which this is done, the coal stream from the chute dwindling away to nothing just as the car is filled and starting with full force as the new car rolls into place. No hoisting time is lost.

The coal sizing as obtained with the crusher set for  $1\frac{1}{2}$  in. is identical with the  $1\frac{1}{2}$ -in. slack from the mine, it being difficult to find the line marking the change in a car partly filled under the tipple and finished out with crushed coal.

The equipment was designed to convert all the lump and nut coal that the mine could hoist (375 tons per hour) into slack. It has been tested up to 3000 tons per hour without reaching the limit of capacity. At this rate about 90 hp. was required for the crusher and 15 hp. for the elevator.

### Use of Colliery Waste Heaps

The *Zeitschrift für angewandte Chemie*, in its Sept. 13, 1918, issue states that it is well known that carbon dioxide is an active agent in the nutrition of plants when applied under suitable conditions. Carbon is gradually converted into carbon dioxide when added to the soil in a finely divided state. The chemical change is brought about more effectively when lime is mixed with the carbon. A recent German patent suggests the use of a mixture of coal dust and lime as a substitute for some of the artificial manures now become scarce. Large quantities of one of these materials exist in the waste heaps in the neighborhood of the collieries.

## Effect of Steam Blowers on Combustion

BY W. D. OWENS  
West Pittston, Penn.

THE use of steam in any form of jet blower diminishes the recoverable heat content of the coal consumed. For instance, it was stated in a recent issue of *Coal Age* that it required 11.61 lb. of air theoretically to convert 1 lb. of carbon into CO<sub>2</sub>. It was also stated that about one-half more air must be added for practical purposes, and many plants are using twice as much. Therefore, practically at least, it requires 17.41 lb. of air to pass through the furnace for every pound of coal consumed.

It was also shown in the article referred to that 8.94 lb. of nitrogen is isolated upon the union of oxygen from the air and carbon, and this nitrogen is of no value whatsoever. Now, since 17.41 lb. of air is necessary, 11.61 lb. is directly concerned in the combustion, leaving 5.80 of unaltered atmospheric air going through the flues. Hence, we have as the product of ordinary furnace combustion 2.67 lb. of oxygen plus 1 lb. carbon plus 8.94 lb. nitrogen and 5.80 lb. of common air, making a total of 18.41 lb. The specific heat of carbon dioxide is 0.217, that of nitrogen 0.245 and that of common air 0.2375. The average of these in the proportion of their densities and percentages is 0.2368. Assuming that the fuel will produce about 13,000 B.t.u., the temperature in the furnace developed by the burning of 1 lb. of this coal will be:

$$\frac{13,000}{18.41 \times 0.2368} = 3000 \text{ deg. F.}$$

If, now, we assume that a steam blower is installed which injects 4 per cent. of steam into the necessary quantity of air (and it must be remembered that the quantity of air cannot be lessened upon the addition of steam into it), and we will have  $18.41 \times 0.04 = 0.7364$   $+ 18.41 = 19.1464$  lb. of air and steam going through the flues. Now since the specific heat of steam is equal to 0.48 (and indeed it cools off so rapidly before entering the grate that its specific heat becomes nearly that of water itself), we have as follows:

$$\frac{13,000}{19.1464 \times 0.2559} = 2653 \text{ deg. F.}$$

It was found in the first calculation that without the use of steam the temperature of the gases should be about 3000 deg. F. Therefore, a decrease of 347 deg. F. when steam is mixed with the draft, means a loss of about  $\frac{437}{3000} = 11.5$  per cent. in the heating capacity or the evaporative power of the boiler.

Of course, the advocates of steam blowers may argue that the steam, when entering the ashpit, and mixing with the air, is the means of raising the temperature of the whole volume of air before it passes through the grate bars, and hence raising the temperature of the whole atmospheric volume going through the flues. This is true, and plenty of experiments have been conducted to find to what extent the temperature is raised when about 5 per cent. of steam is mixed with the draft. The results average about 65 deg. F. Therefore, there is no valid objection to deducting this from the result of the foregoing calculation. Thus 347 — 65

$= 282$  deg. and  $\frac{822}{3000} = 9.4$  per cent. of loss. In addition to the foregoing the steam taken from the boilers to operate a "steam blower" so as to produce the draft, lessens the practical operative horsepower of the boiler about 10 per cent. more. Thus, in the aforesaid calculation, it was found that 4 per cent. of steam furnished in a volume of air, one-half more than that theoretically necessary, amounted in weight to 0.7364 lb. of steam furnished for every pound of coal consumed. If we now take the average evaporative power of coal to be about 6.5 lb. of water, we are losing when using steam for steam blowers about  $\frac{0.7364}{6.5} = 11.3$  per cent. of the capacity of the boiler plant. Therefore, between the loss of power caused by the steam passing through the fireboxes and the quantity of steam taken away from the boilers through the steam blowers, we have  $9 + 11 = 20$  per cent. of the power of the boiler plant that is consumed in its own operation.

The presentation of the facts in this form should seriously impress upon the minds of every foreman in charge of a boiler plant the great amount of power wasted and dividends lost, to the company, when steam is thus used carelessly. It should also convince him that no steam whatsoever should be mixed with the air draft of any boiler plant, unless the quality of the coal is such that this must be done in order to prevent serious trouble and expense from the effect of clinkers.

I have heard the remark upon several occasions, from men well educated, that the steam from steam blowers, passing through the fire grates into the furnace, is a source of considerable increase in the temperature of the gases in the combustion chamber. I am sure, however, that if they had given the subject any serious consideration they would think themselves rather ridiculous. The reason for this claim is, of course, that steam in passing through the fire is disintegrated into its original gases—oxygen and hydrogen—and that on the recombination of these gases to again form water, the temperature is raised to a point somewhat above 5000 deg. F., this being the temperature realized in the oxyhydrogen blow pipe.

It is not necessary to say a single word upon the absurdity of such a possibility. How can disintegration and reunion take place through the medium of heat and be accompanied by an evolution of heat?

The only points that can be advanced in favor of using a steam blower are: (1) That the steam issuing from such a blower into an ashpit raises the temperature of the air before it enters the fire, and therefore the ultimate temperature of combustion is to that degree higher than it would have been without the steam. (2) The steam mingling with the air keeps the bottom layer of fuel resting upon the bars moist, and hence prevents clinkers from adhering to the grate, and walls (if the coal contains sufficient iron pyrites to cause such trouble). Furthermore in keeping the material loose, it also aids in preserving an air passage open through the bars.

## Sociological Work Accomplished by the Consolidation Coal Company

THE slogan appearing in each issue of the *Mutual Monthly Magazine*, which is published by the Consolidation Coal Co., reads: "Our interests being identical we work together for our common good—employer and employed." This announcement is an indication of the spirit with which this prominent miner and shipper of coal approaches problems connected with its employees. The Consolidation has over 10,000 names on its payroll, and has established what it calls an Employment Relationship Department. This department looks into the health, education, amusement, recreation and other matters connected with the mining population about the company's various plants. The stars on the service flag of the company number 1174, about 10 per cent. of the employees having joined the colors.

The work of the Employment Relationship Department is most interesting. Possibly the health of the employees and of their families is given the first consideration. A force of 44 doctors and 13 trained nurses attend directly to this matter in the different divisions of the company, and their skill is reflected by the good health conditions of the mining towns under their charge. Registered trained nurses who have had more or less training in town and country practice were secured, though they must have had at least one year's practical experience before entering the employment of the company. In selecting the nurses, personality as well as education, training and experience were taken into consideration. Their duties are numerous and varied, and their work most exacting and trying; diplomacy, tact, knowledge, experience and untiring effort, combined with a pleasing personality, are among the necessary qualities they must possess in order to insure success in their work.

The nurses work with the doctors under the general supervision of Director C. L. Green, of the Employment Relationship Department, but are subject to the orders of the division managers so far as their duties pertain

to local matters of discipline and the policy of the company. The general scope of their work, general activities and so on, are outlined by Director Green, to whom weekly reports are submitted. These reports show considerable activity on the part of these nurses during the year 1917, as the following formidable list indicates:

Nursing visits .....	7499	Office cases .....	1485
Instructive visits .....	6770	School cases .....	56
Social visits .....	6498	School examinations .....	
Miscellaneous visits .....	561	(medical) .....	373
Home visits—school cases .....	237	School talks .....	235
Field cases .....	1468	Meetings attended .....	71
		Dressings .....	1259

In addition to the duties connected directly with health work, these nurses engage in general community and playground work, kindergarten activities and domestic science instruction; they also conduct safety and first-aid classes among the children, and

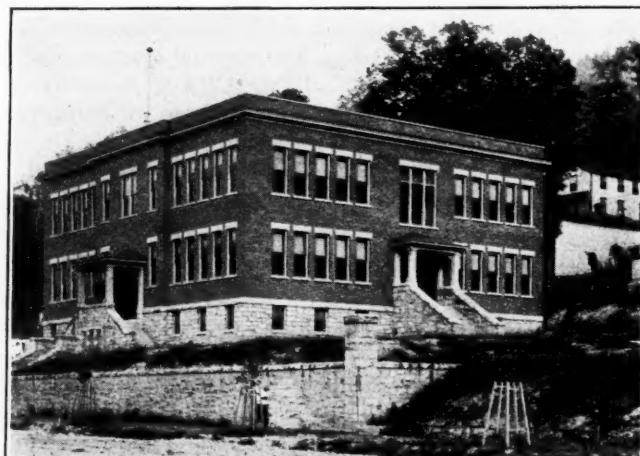


FIG. 2. SCHOOL BUILDING AT JENKINS, KY.

visit the schools, where they give health and first-aid talks and demonstrations. They visit the healthy as well as the sick, and are always prominent in local Red Cross and relief work. Furthermore, they have organized Junior Boy Scout companies and sewing circles. At the community houses they meet with the women of the mining towns and instruct them in knitting, sewing and cooking. They also teach hygiene and report on the sanitary conditions of the mining towns.

The importance of this work can hardly be overestimated, and these nurses would be sorely missed were they to be withdrawn from their sphere of usefulness. In some sections access to the various communities in which they work is facilitated by modern methods of travel, but in the Kentucky divisions in winter it may be quite another matter—quite different from the enjoyable horseback ride in "the good old summer time," as shown in Fig. 1.

An admirable system of nursing has been worked out by Mr. Green and one that is producing good results. A nurse is placed in charge of a district and is given general instructions only; she is held responsible for her work and given full latitude as to the methods to



FIG. 1. ON HORSEBACK IN KENTUCKY MOUNTAINS



FIG. 3. INTERESTING GROUP OF YOUNGSTERS IN THE KINDERGARTEN CLASS—CHILDREN OF CONSOLIDATION EMPLOYEES

be used in accomplishing the results desired. The nurses feel this responsibility and respond to the confidence placed in them, seeming to be more inclined to offer suggestions as to improvements in methods of doing their work than they would be when acting under detailed orders and subject to much supervision. Mr. Green expressed himself enthusiastically about the present corps of nurses, commenting especially on the willingness they showed in assisting to combat the poliomyelitis epidemic at Monogah, W. Va., during the summer of 1917.

The hospitals of the company in the various divisions are said to have been operated with great success from a medical point of view. New hospital units were built during the year 1917<sup>1</sup> and others are under construction. Among those completed are a hospital in the Pennsylvania division at Gray and two in the Miller's Creek division (Kentucky), one of which is a small emergency hospital room. The men in the Maryland division, Pennsylvania division (in part) and West Virginia division are cared for in state hospitals.

<sup>1</sup>See *Coal Age*, page 543, March 23, 1918, for view of Consolidation hospital at Jenkins, Kentucky.

The activities of the Employment Relationship Department along educational lines are quite comprehensive and include the following: Coöperative work with public schools; kindergarten work done by the company; domestic science work done by the company; general educational work relating to hygiene, sanitation and so on. The company assists the public schools with money, school plots and in the building of schools, supplements teachers' salaries in order to secure a higher class of instructors, assigns visiting nurses to give safety and first-aid talks and demonstrations, awards prizes for the best-kept school grounds during vacation periods, and promotes other similar activities.

Among the fine up-to-date school buildings in the vicinity of the mines of the company is the school at Jenkins, Ky., shown in Fig. 2. Others of a similar character are being built, and all the schools are furnished with the most modern equipment obtainable. The kindergarten work carried on by the company's teachers begins with the ending of the regular school term and continues until the opening of the public schools in the fall. Excellent results have been obtained through this work, and great interest is always shown by the chil-

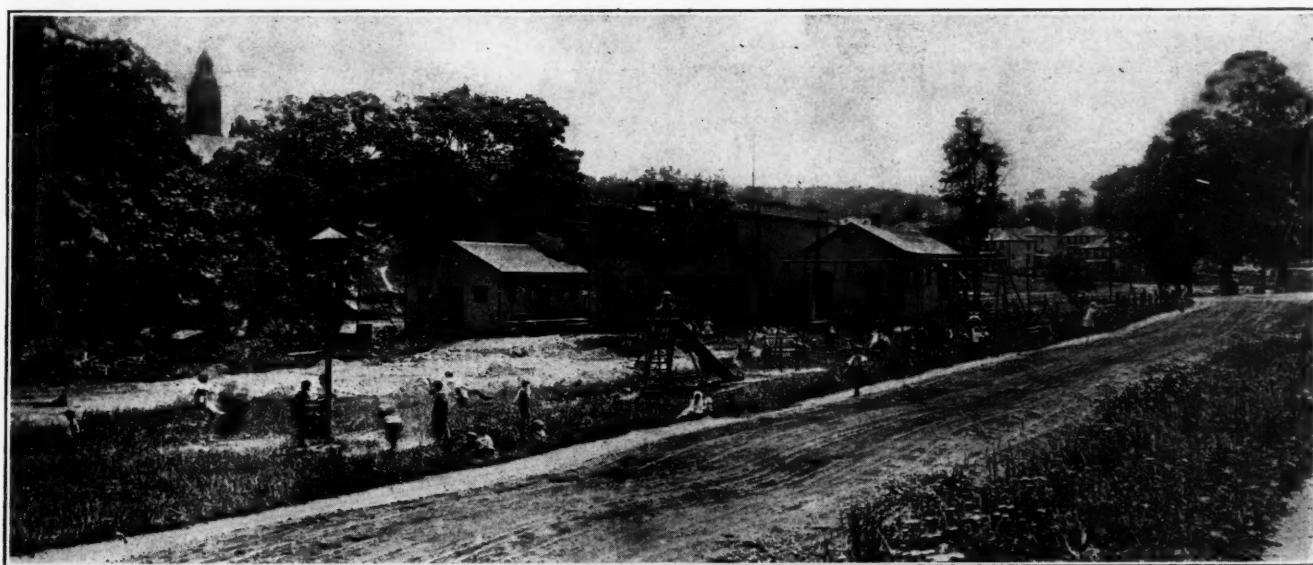


FIG. 4. PLAYGROUND AT A MINING TOWN OF THE CONSOLIDATION COAL COMPANY

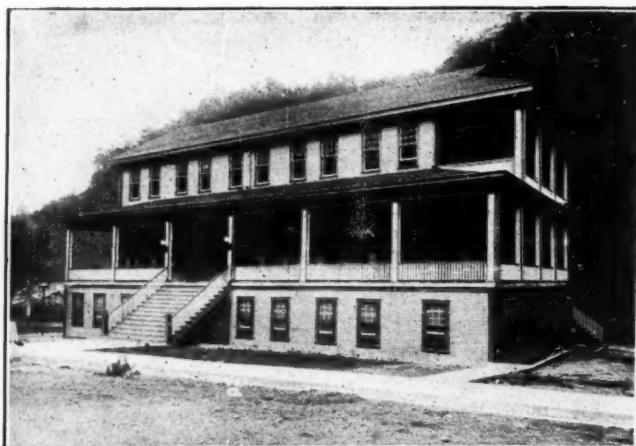


FIG. 5. RECREATION BUILDING AT McROBERTS, KY.

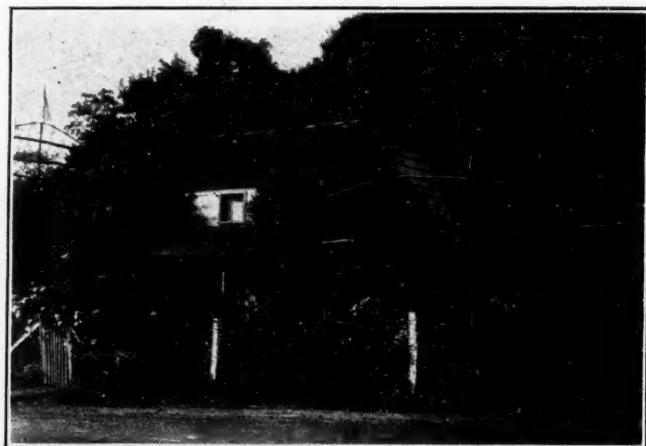


FIG. 6. MINER'S HOME IN THE MARYLAND DIVISION

dren and by their parents. There is an excellent field for kindergarten enthusiasts at the mining villages, and nowhere should more marked results follow a successful teacher's efforts. Carried on at a time when the regular schools are not in session, its activities follow along lines advocated by many leading educators. One of these kindergarten classes is shown in Fig. 3.

Domestic science instruction is also furnished by the company's teachers during the vacation period, children as well as adults being given instruction in cooking, general housekeeping and sewing. These teachers sometimes occupy one of the miner's five-room houses when a community house is not available, in which event the upstairs rooms are used as living quarters and the first floor is thrown into one large room. In addition to the regular domestic science work, this room is also used by Red Cross, Little Mothers' League, Camp Fire Girls, Boy Scouts and similar organizations. In the domestic science work, plain cooking of the foods within the reach of the population at the mines is taught and the foods are cooked with the same fuel as that used at the homes. At the time the instruction in preparing foods was given it had to do with those materials which were re-

garded as non-essentials to the war; it included demonstrations in the use of corn, rye, barley and other grains used as substitutes for wheat flour.

In general educational work relating to hygiene, sanitation and so on, is included the work done by the visiting nurses at the homes of the employees, in the recreation buildings and in the community houses. This work is carried on throughout the year and consists of get-together meetings, lectures, talks, cooking demonstrations and sewing and knitting classes. All these activities seem to be beneficial and productive of good general results, as they create interest in the locality and tend to stabilize labor.

Recreation and relaxation of employees are provided by the Consolidation company in the shape of indoor amusements and theatricals, outdoor directed amusements and playground work and outdoor undirected amusements. An outdoor playground is shown in Fig. 4. The physical director is on hand for any of the indoor amusements or sports carried on in the various recreation buildings and which consist principally of billiards, bowling and basket ball. The recreation buildings are twelve in number, three being in use in

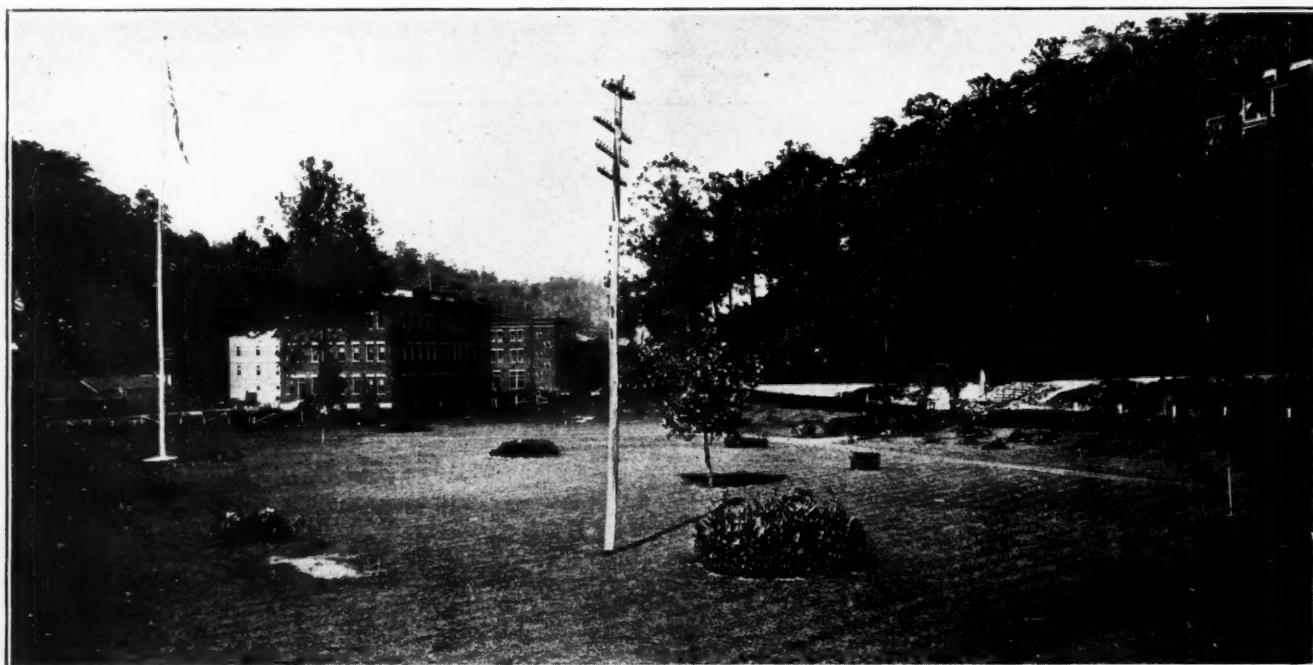


FIG. 7. A CONSOLIDATION PARK AT JENKINS, KY.; OFFICE AND RECREATION BUILDINGS ON LEFT

West Virginia and nine in Kentucky. In the latter state, at all but one location, these buildings are in duplicate—one for the white and another one for the colored element of the population.

Permanent recreation buildings are planned to replace the three structures in West Virginia, as these are temporary in character, and a fourth building is under consideration. Another building is also planned for the Pennsylvania division. Those mining towns near large centers of population are in a different class from those villages remote from large towns. Under the latter class come the mining towns of Kentucky; here four of the recreation buildings in the Elkhorn division of the company have auditoriums where high-class pic-

ture plays (the best that can be secured) and other theatricals are given.

and equipped, this at their own expense. The Ida May (Mine No. 87) baseball team, which made such a fine record during the past season, is shown in Fig. 9. Mine No. 87 is the recent shaft development of the company, near Fairmont, W. Va. A band has been organized among the Consolidation employees at Jenkins, Ky., and their playing doubtless contributes to the pleasure of those living in that section, judging from the group shown in Fig. 8.

The Employment Relationship Department is particularly active as regards publicity matters. In December, 1917, the first number of the Consolidation Coal Co.'s *Mutual Monthly Magazine* was published by this department, and it was decided to issue this magazine regularly, between 10,000 and 11,000 copies being printed each month. The entire expense of publishing and distributing the magazine is borne by the company.

The Consolidation company, through the medium of its monthly magazine and printed circulars, endeavors to present timely information to the miners and their families. Each payday a different circular is handed to the men; these are made so attractive that the recipients almost invariably take them home. The information in the circulars is



FIG. 8. JENKINS (KY.) BAND—ALL EMPLOYEES OF THE CONSOLIDATION COAL COMPANY

ture plays (the best that can be secured) and other theatricals are given.

In Fig. 4 is shown the manner in which the Consolidation company has beautified the grounds in the vicinity of the office building and the recreation hall (on the left) and the hospital (on the hillside to the right) at Jenkins, Ky. The recreation building for the white population at McRoberts, Ky., is illustrated in Fig. 5. For the same reason that auditorium facilities are necessary in Kentucky, the recreation buildings planned for the isolated sections in the West Virginia division will also have provision for the giving of both theatricals and moving picture shows.

A physical director guides those participating in outdoor amusements and playground work. Tennis courts and baseball diamonds have been provided by the company. The men about the mines appreciate the facilities for sport and congregate on the recreation grounds after work. During the summer of 1917, two male and two female physical directors were employed to good advantage. Baseball is the popular outdoor amusement of the men, the inter-division games and the games with outside-industrial teams being played to large audiences of interested "fans." The teams are fully uniformed

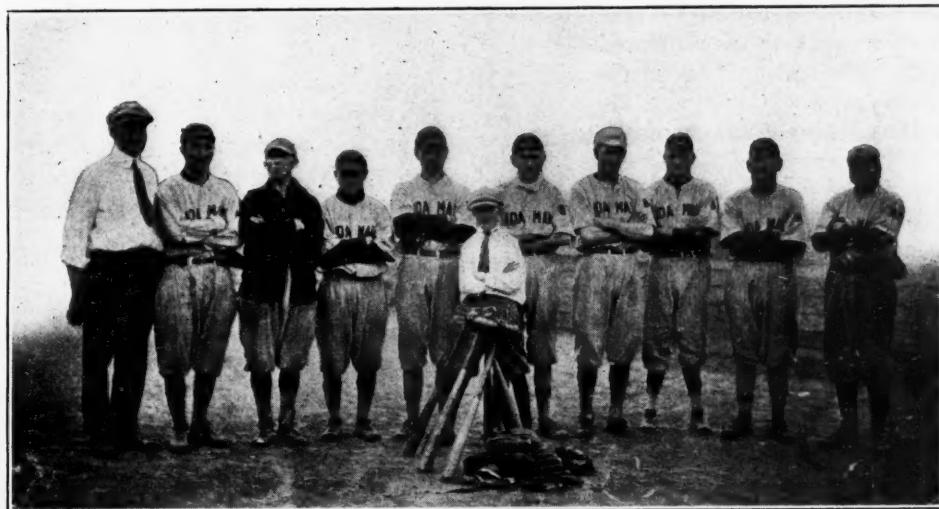


FIG. 9. BASEBALL TEAM OF THE IDA MAY MINE, NEAR FAIRMONT, W. VA.

intended to interest in turn the miners and the various members of their families—the women and the children about the mines.

The monthly magazine touches on a variety of topics and endeavors to reach the men from every angle. Interesting sketches are published of prominent men connected with the company, or others deserving of special mention, or maybe a description of some interesting piece of work about the mines. Popular interest is maintained in this family paper by printing all interesting personal items about the employees and their families. The various activities encouraged and directed

by the Employment Relationship Department are all regularly commented upon and accompanied by numerous illustrations.

Every encouragement is given to the population about the mines to cultivate gardens—they greatly improve the appearance of the house lots and have a decidedly practical bearing as contributing most acceptable supplies for the housekeeper. Prizes were offered for vegetables only during the season just ended, and no men on the monthly payroll were eligible for garden prizes. Due to the urgent need for home production of food products, especial attention was given to vegetable gardening, the object being to have the largest possible crops raised on the ground available for cultivation.

Considerable enthusiasm was aroused by the company's garden policy. For example, in the West Virginia division of the Consolidation, three cash prizes were offered to each of ten groups of mines in addition to the division or regional prizes. Thus the group first, second and third prizes were \$15, \$10 and \$5 respectively, the corresponding division prizes being \$35, \$25 and \$15—a total of \$370 and 33 prizes in this division alone. In judging the gardens for awarding the prizes, variety, arrangement of vegetables planted and condition in which the garden was kept counted 50 points; quantity of vegetables planted as compared with the ground available made up the remaining 50 points. In judging, surrounding circumstances such as condition of the soil and local obstacles met with in making a garden were considered, as well as the number in a family who could work in the garden. At the end of the season after the prizes had been awarded, further prominence was given the matter by publishing illustrations of the successful competitors and also views of their gardens. This was an additional incentive to excel, for few fail to appreciate publicity—a deserved compliment after a season of toil, in many cases at odd hours after the regular work of the day was over.

In Fig. 10 is shown the garden which received the second prize in the West Virginia division for the year 1918; those who were responsible for the success of this garden are also shown. The illustration brings out nicely some of the benefits derived from a cultivation of the ground around the homes of the miners. A further instance of what can be done in the way of making the home surroundings attractive by planting shrubs, vines and flowers about the house—and then caring for them—is also shown in this illustration.

Among the activities encouraged by the Employment Relationship Department community work stands out prominently. There would seem to be few sections of the country in which the people should respond quicker to

this influence than in the coal-mining regions. Those living in villages about the mines have some decided advantages over the scattered population in some rural districts, it is true, but frequently the landscape about coal operations is most unattractive. The miners and their families need influences which tend to take them away from thoughts of their work and their surroundings, and out of themselves—who does not for that matter, at times?

### Can Holland Supply Itself with Coal?

According to the *Allgemeene Handelsblad*, the whole production of coal in Holland has considerably increased since the beginning of the war. It now appears that Holland can, though with some difficulty, provide herself with fuel without having recourse to imported coal. Before the war, about 7 million tons a year were re-



FIG. 10. GARDEN WHICH TOOK SECOND PRIZE IN THE WEST VIRGINIA DIVISION

quired for Dutch consumption. Of this quantity, the Limberg mines produced at the most a third. During the war production increased by 270 tons a month. The output of brown coal has largely increased. Peat equivalent in heating power to 350,000 tons of coal was produced this year. The use of this fuel is finding favor and consumption is increasing rapidly.

On Sept. 3 the *Zeitschrift für angewandte Chemie* republish the item quoted above. In its preceding issue, however, the *Zeitschrift* had made a statement which appears somewhat at variance with the one given in the *Handelsblad*. The statement referred to is as follows: "In accordance with a recent agreement with Germany, Holland is now receiving more coal from Rhineland-Westphalia. Since the beginning of the month two railway trains have been dispatched daily from that coal-producing district to Holland, laden with 1500 tons of coal. For the present four such trains are to run daily, laden with 3000 tons. Hence some 78,000 tons a month will reach Holland by railway, so that of the total 120,000 tons agreed upon, there will be left 42,000 tons for carriage by water."

## New Mine Headlight for Haulage Locomotive Use

The Electric Service Supplies Co. will shortly place on the market the type MLC-96 Golden Glow incandescent headlights for mine use. These headlights are similar in all general features to the type ML-96, except that the case instead of being drawn steel, is made of cast iron, and provide high illumination under all conditions encountered in mining service, combined with low current consumption and maintenance cost, thus offering an efficient form of headlight for haulage locomotive use.

The headlights are equipped with yellowish green mirrored glass reflectors, which are first molded to the form of a true parabola and then accurately ground, after which they are polished and silvered. The light, in striking the mirrored surface, is reflected back through the glass, and in passing through this special glass the violet and blue rays are absorbed, leaving a beam of golden-yellow light, which penetrates fog, dust and smoke to a greater extent than is possible with a



REAR VIEW OF MINE HEADLIGHT

white light. Furthermore, the dazzling and blinding effect of a white light is avoided. These glass reflectors, in addition to being highly efficient, are also durable, permanent, cannot tarnish or scratch, are easily cleaned and do not require polishing. Taken from any angle, they make an exceedingly efficient headlight.

Type MLC-96 headlights, being designed especially for mine use, have the reflector and socket flexibly suspended in the case, in order to prevent the vibration of the mine locomotive from breaking the lamp filament. The case is made of cast iron, with a rear door which permits of the adjustment of the socket so as to bring the lamp filament into the exact focal point of the reflector. The reflector, with the socket and all other mechanism and spring support, is mounted in a shell that is removable through the front door, making all parts accessible for inspection or repairs.

These headlights are suitable for 56-, 72- and 94-watt concentrated filament Mazda lamps having a light center length of  $2\frac{1}{8}$  in., and satisfactory results cannot be secured from any other type or size of lamp. They may be connected in series with special resistances designed for the purpose, or in series with other incandescent lamps on the locomotive, provided these lamps are of exactly the same current consumption and of the proper voltage. The headlights complete weigh approximately 25 pounds.

## Legal Department

**TRESPASS UPON COAL LANDS**—In Maryland, where a mining company negligently encroaches upon the coal deposits of adjoining land, the aggrieved owner is entitled to recover the value of the coal at the mouth of the mine, not being limited to the value of the coal in place. This rule has not been changed, as applied to merely negligent trespasses, by the Maryland statute which declares that one who furiously or in bad faith abstracts minerals for the land of another shall be liable for the value of such minerals, without deduction on account of the expense of mining. (Maryland Court of Appeals, Monahan vs. Mt. Savage George's Creek Coal Co., 104 Atlantic Reporter, 480.)

**INDIANA WORKMEN'S COMPENSATION ACT**—A mine employee was not debarred of right to an award under the Indiana Workmen's Compensation Act, for loss of the sight of an eye following an injury in the course of his employment, because he failed to give the employer written notice of the injury, where it appears that the employer had actual knowledge of the fact of the injury, and where the employer's company physician assured the injured man at first that the injury would not be serious. A coal-mining company has sufficient notice of an accident to a miner if the pitboss or foreman knows of the occurrence. (Indiana Appellate Court, Candalia Coal Co. vs. Holtz, 120 Northeastern Reporter, 386.)

**LIABILITY FOR ROOF FALL ACCIDENT**—Where a landslide at a mine left dirt and debris on tracks leading into the mine, an employee engaged in removing the same, preparatory to timbering, was entitled to assume that the coal company had made his place of work reasonably safe. But if a fall of rock and dirt from the roof at that place was so apt to occur that a miner of ordinary prudence would not have encountered the danger, the employee assumed the risk of injury from such a fall. (Kentucky Court of Appeals, Wallace vs. Hazard Coal Co., 205 Southwestern Reporter, 692.) The Virginia statute, requiring miners to prop and secure their working places, does not apply where danger at a particular place was not of such character as to call for use of props, as determined by the mine foreman or the miner making a report of unsafe condition. A miner was not negligent in working in a place which the foreman had assured him would be made safe, and which the slate men told him had been made so. Under the Virginia statutes negligence of a mine foreman, boss, or fireboss, and their assistants, in the discharge of statutory duties, is negligence of the operator. (Virginia Supreme Court of Appeals, Keen vs. Jewell Ridge Coal Corporation, 96 Southeastern Reporter, 767.)

**SURFACE RIGHTS FOR MINING PURPOSES**—Mere failure of a mine owner for a long time to exercise mining rights in the surface of land does not extinguish them. A grant of ways into, over, and under a tract of land, at such points and in such manner as may be necessary and proper for the mining and marketing of the coal under it, does not limit the grantee to a single way or opening. Under such a grant, ways and openings that are appropriate, useful and convenient in the mining of the coal are legally necessary and proper. Mere inconvenience to the owner of the surface, wrought by the exercise of mining rights, does not constitute a limitation upon them. The existence of a small garden cultivated by a tenant on the surface does not prevent the owner of mining rights from exercising them at that point. A clause in a deed granting mining rights, which absolves the grantee from liability for injury to springs in the surface or destruction thereof, as an incident of the removal of the coal, justifies such injury or destruction at such time as the mine owner may see fit to take out the coal, and injury to a spring constitutes no ground for restraining mining operations. (West Virginia Supreme Court of Appeals, County Coke Co. vs. Elkins Coal and Coke Co., 96 Southeastern Reporter, 973.)



## New Order Definitely Fixes Price of Household Coke

An order providing that, in localities where anthracite is obtainable, the prices to dealers of byproduct coke for distribution by them in less than carload lots or for household purposes shall not exceed the established maximum prices of gas coke sold under the same conditions, was announced Dec. 29 by the United States Fuel Administration.

The order became effective Jan. 1 and applies to prices at point of production. It was stated that its effect would be to lower the maximum prices of byproduct coke, which already is selling at less than these prices in some localities.

Another order, also effective Jan. 1, established definitely that in localities where anthracite coal is obtainable the prices to dealers of gas coke for distribution in less than carload lots or for delivery direct to consumers for household purposes shall be the same as the lowest price for a 2000-lb. ton of stove anthracite at the mines plus the lowest freight rate to the point where the coke is produced.

This order followed receipt of information that in some places the standard 2000-lb. ton of coke was being compared for price-fixing purposes with the anthracite ton of 2240-lb. and that question had been raised as to what anthracite price should be taken for comparison. The order makes it clear that for comparative purposes the ton shall be 2000 lb. of coal and coke alike, and that the lowest anthracite price in the district taking the lowest freight rate to the point of coke production is meant.

## Rear Admiral Reports on Use of Coal by American Navy

During the fiscal year ended June 30, 1918, the Navy required more than 4,000,000 tons of bituminous coal. Rear Admiral McGowan, in his report to Congress, discusses various phases of the use of coal by the Navy. In part, he says:

For the fiscal year 1917, the total Navy requirements were approximately 1,200,000 gross tons; while in 1918 the tonnage required was in excess of 4,000,000 tons. Of this tonnage, delivery was taken by the Navy of about 3,500,000 tons at principal tidewater ports, the balance being distributed among smaller stations and various interior points.

The Navy's anthracite coal requirements are as yet comparatively light, being in 1918 about 70,000 tons, principally at North Atlantic ports—approximately three times more than the quantity used during the previous year.

In the distribution of the Navy's fuel requirements, it was found necessary at the beginning of the fiscal year to meet the emergency conditions at the then early period of the war to place allotments with the leading suppliers throughout the country for an equitable share of the total production, in order that the unexpected demand could be divided as far as practicable among every leading interest concerned; in doing which care was exercised to have these allotments represent, as far as possible, a proper *pro rata* of the total production from the companies involved, based upon their percentage of output, proximity to the transportation required, convenience of facilities, etc.

In doing this, the question of price to be paid received special consideration which, in the case of coal, was taken care of by prices fixed in August, under Executive announcement, adopting as the unit base at leading districts of Navy coal production the following prices: Pennsylvania, Maryland and West Virginia (Pocahontas field)—\$2 per net ton or \$2.24 per gross ton; West Virginia (New River district)—\$2.15 per net ton or \$2.408 per gross ton. This basis has since been generally increased by different Executive modifying orders advancing the prices indicated, including wage increase of \$0.45 per net ton and relative advances in central Pennsylvania, Maryland and New River district, West Virginia, to correspond with the increased cost of production in those districts, developed since the adoption of the initial fixed basis; the average price during the latter half of the fiscal year being approximately \$3 per gross ton at mines producing Navy coal.

In the matter of coal, the fuel problem has been largely narrowed down to the production of "Navy Standard" furnished from mines accepted for this purpose after careful inspection and tried experience and of which the total output is limited—rendering it necessary that the utmost conservation be used in this high-class coal; to which end wherever possible other high-grade coal is being used by the Navy on work of lesser importance in order that this Department may at all times closely coöperate with the pressing requirements of other military arms of the service; and the entire commercial program as a whole, in which the vital question of our transport service and assistance to the allies has not been lost sight of.

In this direct connection, it is not inappropriate to refer to the benefits secured by all concerned in the more rapid and elastic coaling of vessels through the Tidewater Coal Exchange created during the year at the principal Atlantic ports, under the operation of which it is not essential in placing loading assignments to designate the specific pier at which vessels must load; and instead all three piers at Hampton Roads—Lamberts Point, Sewalls Point and Newport News—can be employed, depending on the supply of coal on hand and open berths available at the time of vessel's readiness. The equalization of coal credits in the exchange or pool, under the rules laid down, satisfactorily takes care of the distribution between coal suppliers and mines at interest, independent of questions as to identity of coal.

In the handling of the daily current problem, the matter of increased storage for fuel, with more rapid handling of vessel bunkering and the transfer of coal cargoes, has been given special attention. Early in the fiscal year a fixed program of increasing all facilities for the handling of

fuel was inaugurated with a view to expanding the facilities then available which were sufficient to meet peace-time needs but entirely inadequate for the rapidly increasing requirements of the Navy.

To this end, a survey has been made of the principal ports where important work is now under way that will not only very greatly increase the total storage but also the daily handling of coal and oil. This particularly includes development on a large scale at New York Harbor, Hampton Roads, Philadelphia, Boston, Baltimore, Charleston, and in fact the survey and consequent work involves every port where cargo shipments in volume are anticipated.

As an illustration of the work done, the two storage plants constructed at Hampton Roads might be cited. One of these, covering approximately fifty acres, has been constructed by the Virginian Railway Co., while the second is being erected by the Chesapeake & Ohio Railway Co.; each having a total capacity of 300,000 tons of coal, with a storing and redelivering capacity at each plant of 300 tons per hour—the former plant being served by a large cantilever gantry crane with several reloading tracks and the latter by two large locomotive cranes of special design, equipped with booms, having an effective handling radius of 102 ft.; while the facilities of both plants as to trestles, convenience of ample track and water deliveries as well as opportunity for the additional free and full use of ships' gear, are unexcelled.

In addition, at principal Atlantic ports the most modern machinery has been provided to expedite the bunkering of ships, including the installation of special elevators both ashore and afloat, enabling the expeditious coaling of any ship under the various governing conditions.

The total plans include the latest mechanical devices and equipment for the rapid and satisfactory handling of coal in all forms and for all purposes, the securing of which, under the manufacturing embargoes more or less existing, has been a complex matter, as well as the question of necessary labor not only for the new construction work but for the manning of the coaling plants as completed.

On this latter point, it has been found necessary to develop a new form of organization which has active charge of the fueling activities at each port where established. An assistant aide for supply in charge of fueling has been appointed, who is directly responsible for the bunkering of all ships and handles all details in connection with the fueling of naval vessels—with results that have already demonstrated the efficiency of the organization; ships being refueled at a minimum of time and expense. The storage of coal alone will, when completed, represent capacity of approximately 1,500,000 tons.

During the year, steps have been taken toward increasing the supply of Navy standard steaming coal, in doing which—after thorough examination and necessary tests—it has been found possible to add a number of mines to the "Navy Acceptable List." A "Supplementary List" has also been established, embracing mines producing a high grade of coal suitable for bunkering purposes on certain types of vessels, thereby conserving the highest grade bunkering coal for purposes where it is absolutely necessary.

In connection with available coal supply, it is expected that further investigation of coal mines in the Matanuska District, Alaska, now actively under way, will show that source of supply to be of substantial service; and to that end provision was made in an Act recently approved authorizing a certain expenditure in the discretion of the Secretary of the Navy for mining and handling coal in that section.

With the development of those fields, it is expected that an adequate supply of coal for west coast and mid-Pacific stations will be provided, it being hoped that the coal will prove of such quality as to make unnecessary the shipment of bituminous coal from the Eastern fields.

Elimination of certain wasteful elements in competition is said to be one of the desires of President Wilson. He is said to favor the enlargement of the Federal Trade Commission to nine members.

## New Cost Report Sheets Require Much Additional Data from Operators

Much additional detail is required in the new cost report of the Federal Trade Commission. Bituminous coal producers whose output exceeds 60,000 tons annually must make returns. Last year those producing less than 100,000 tons were permitted to make out a much less detailed report. In the new report, it is required that all details of cost must be divided between labor and supplies. Information is required under the following headings, each of which has numerous subdivisions: Mining, ventilation, drainage, yardage and deadwork, stripping, haulage, tipple operation, preparation (commercial coal), power, overhead, fixed charges to mining, other charges to cost, credits to cost, selling expenses, general expenses and administration, miscellaneous income, deduction from income, sales of coal produced, departmental transfers. The following accounts are to be used in the balance sheets:

**Assets**—(a) Current assets: (1) Cash in bank and on hand; (2) accounts receivable—current; (3) notes receivable—current; (4) inventories, less reserve for doubtful accounts. (b) Deferred assets: (1) Insurance paid in advance; (2) taxes paid in advance; (3) royalties paid in advance; (4) stripping done in advance. (c) Intercompany accounts: (1) Accounts receivable; (2) notes receivable; (3) loans. (d) Investments: (1) Stocks of other companies; (2) bonds of other companies; (3) mortgages; (4) real estate not used in coal production. (e) Fixed assets: (1) Coal lands and ore veins held in fee; (2) buildings, (3) machinery and equipment; (4) development charges; (5) office furniture and fixtures, less reserve for depletion and depreciation. (f) Good will, leaseholds, property rights, etc.

**Liabilities**—(a) Current liabilities: (1) Trade accounts payable; (2) trade notes payable; (3) wages accrued. (b) Accrued liabilities: (1) taxes; (2) interest; (3) unclaimed wages. (c) Intercompany: (1) Accounts payable; (2) notes payable; (3) loans. (d) Capital stock—preferred; (e) capital stock—common; (f) bonds; (g) mortgages; (h) loans and notes payable, bank or open accounts; (i) appropriated surplus; (j) surplus.

## Eastern Coal To Move to Middle West

Eastern coal has been made available to dealers and consumers in Ohio, Indiana, Illinois and Michigan, provided the approval of the state fuel administrator can be secured. The coal will move on out-of-zone permits issued by the United States Fuel Administration. Many dealers and consumers in the Middle West have disposed of their stocks of low-grade coal, and it is believed that no injustice will be done in the great majority of cases by allowing the purchase of higher grade coals. It is believed, however, that the state fuel administrator will be zealous in protecting any centers where accumulations have not been disposed of. One city, for instance, acting in full accord with the state administrator, established a pool and brought in a very large supply of the only coal that was available at that time. It will be necessary in that city for the state administrator to afford this protection for some time to come.

## THE LABOR SITUATION

EDITED BY R. DAWSON HALL

### General Labor Review

In the anthracite region the mine workers are still disposed to rebel because they did not get the second war bonus for their work in the month of October which apparently they believed they were going to get up to the day on which the award was announced by Dr. Garfield. The late date at which the award was made would have made a retroactive bonus unfair unless the Fuel Administrator could have contrived a retroactive price. That he could not do.

In Illinois, where work is now scant, the mine workers want Government ownership. They say the Government would keep them working steadily despite business conditions. We commend them to confer with the munition men who are being laid off. The Government has no work for them though the industry was created by the Government. The mine workers have noted how the whilom munitioner is coming back to the mines now he is not wanted, though he refused to come back when he was wanted. But he can perform a considerable service to the nation by informing the mine workers that the Government will not and indeed cannot guarantee steady work. It buys today and refuses to buy tomorrow as its necessities require, and when the Government owns the plant it is shut down just the same when the need for the material ceases.

Up in the anthracite region Federal agents are busy trying to find why men won't work. A local correspondent well says: "The Federal agents will doubtless have a pleasant stay and the miners will lose time as before. The only cure for loss of time is dismissal, a cure which is now out of fashion. In the Schuylkill field where no one is allowed to work a breast unless assisted by another man the tardy workers cause hardship when paired off with steady men. If a 'butty' cannot be found for a miner, he must return home or work at 'company work' at a considerable loss to himself." It is a pity that owing to an apparent difference in scale, the Gallagher law, the variant mining conditions and the remoteness of the fields, Illinois mining men will not try to find work in the anthracite region. If they did the overplus in the Middle Western fields would readily solve the problem for the hard-coal producer. That the Illinois labor is not thus available is the more regrettable because the incoming soldiers in the anthracite region are not proving willing to settle down to their old employment. Returned soldier boys are not taking their old positions at the mines. They are spending vacations of varied length and then departing for the city centers in search of work. Many men are seeking employment as "company men," but few contract miners can be secured.

In the Big Sandy region of eastern Kentucky, especially in Pike County, no little labor trouble has arisen. It is said that the operators of the region are discharging men for joining the United Mine Workers of America, the trouble seeming to center around Pikeville where Vice President Pettry of District No. 17 and a party of organizers of whom he was in charge have been arrested. According to President Keeney further attempts to organize the mines around Pikeville were abandoned pending a meeting of the International Board at Indianapolis on Jan. 6. At the present time 2250 mine workers in the Kentucky field have joined the organization.

So much for eastern Kentucky. The other end of the state has its troubles. In Hopkins County, still a non-union field, the operators have asked the mine workers to accept a reduction of 5 per cent. in their wages because work has been slack. It seems quite probable that the men will accede to the demand made on them, for in the week ending Dec. 21 the idleness from lack of orders reached 26.9 per cent. and from all causes 42.2 per cent.

### Anthracite Mine Workers' Insurgency

The old year at its end saw insurgency at its height in the first district of the anthracite region. On Dec. 28 an insurgent meeting was held by 125 delegates which by resolution instructed a committee to bring John Lewis and William Green, international vice-president and secretary respectively, before a convention of mine workers to explain the provisions of the recent wage agreement. Both the officers of the union have sent word that they will appear. President Frank J. Hayes, the international president, will not be able to attend.

The consent of Lewis and Green is tantamount to a recognition of the insurgent convention which is to be called despite the protests of the tridistrict board which is in charge of the labor destinies of the anthracite region. For two years there has been a growing disposition to contest the judgment of the ruling powers. A rival organization has even been built up. Now at last insurgency within has become so strong that insurrection is recognized. The insurgent does not have to leave the union. He now continues a member and modifies the administration of the union even if he does not actually regulate it.

### Bolshevism in Illinois Mines

Illinois miners are becoming increasingly restive under the slow work which has prevailed since the armistice was signed. This feeling took form as a demand on the Government that it assume the ownership of the mines, the resolution being passed at a crowded mass meeting held at the Lyric Theater, Belleville, Ill., Sunday, Dec. 29. The meeting was called to discuss the present lack of employment and to decide upon a remedy.

After addresses by Duncan McDonald, former secretary-treasurer of the Illinois United Mine Workers, now secretary-treasurer of the National Coöperative Association; Andrew Wilson, of the Alliance of Labor and Democracy; President Daniels, of the Belleville sub-district; and Vice-President Carbine, of the Illinois State Federation of Labor, the following resolutions were adopted:

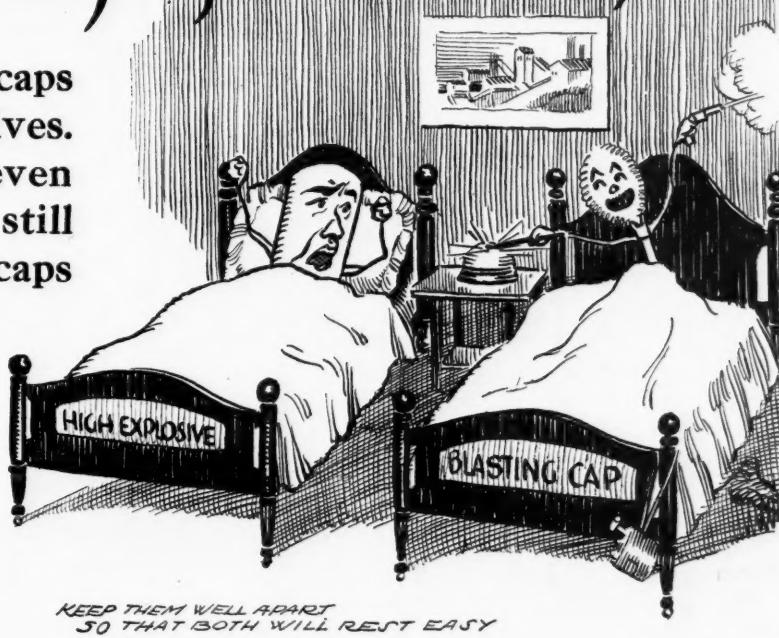
"Whereas, private ownership of coal mines creates acute competition in the market, and as, under the private ownership, mines are operated only for profit without regard to the interest of the miners, and whereas past experiences have proved that private ownership of mines and the operation of the same at such times as the private owners see fit has made the employment of mine workers insecure and worked a hardship on them and their families, and whereas there are hundreds of miners in the Belleville sub-district out of employment, and hundreds working less than half time due to private ownership and private management of mines, therefore be it resolved that the miners of Belleville earnestly and urgently call upon the House of Representatives and the Senate to enact a law providing for Government ownership of all mines in the country, and the democratic management of the mines by the miners employed therein."

St. Clair County, in which this meeting took place, is one of the biggest coal-producing counties in Illinois. When the resolutions were introduced Philip Veal objected to their adoption and urged that another resolution be drafted in favor of placing the mines under the control of a Workingmen's Council. He moved that three cheers be given "by the soviets of Belleville who are in sympathy with the soviets of Europe," but the three cheers were not given. They were headed off by calls for the adoption of the Government ownership resolutions, and the meeting proceeded to pass those resolutions as written.

# Explosives and Blasting Caps are Poor Neighbors

**D**O not store blasting caps with high explosives. If they are kept even three feet apart there is still danger, because blasting caps go off easily; and when they explode they cause the high explosives to go off also, if they are at all near each other. Therefore, blasting caps and high explosives should be kept at least 10 feet apart.

What difference in effort does it make to you, when putting them both away, if you put them a few feet apart or put them both together? But what an awful difference it would mean should something accidentally set off



your blasting caps when they are near your powder.

Last year at a neighboring mine a man was carrying his blasting caps and two sticks of powder in his inside coat pocket. Without thinking, he shook the fire out of his pipe and stuck it in with the caps and explosives. The caps exploded and fired the explosives, and his entire side was blown off.



Think about this accident and don't carry explosives and caps together when you go into the mines. If you carry the caps, let your buddy carry the powder; or, if you must carry both yourself, carry caps and explosives in entirely separate places.

—Safety letter from a large company to its men.

## EDITORIALS

### Do Less and Have More

**W**ORKINGMEN in England want the 44-hour week. If they want more leisure, the idea is not bad. If they think that in the shorter time they might be able to do just as much work, they would be advancing a proposition having some slight element of feasibility, especially in some lines of work. But strange to relate, instead of presenting either of these reasons, the British workmen say they want to reduce production.

They wish to reduce production, be it noted, with every mother's son of them complaining that they do not have enough, not of one thing but of everything. Where the things they produce go to, nobody knows. They produce too much and yet they have too little. Some one must dump part of the production into the Thames and the Mersey.

We all want more than we are getting. Write that in your political economy. If we all work more, we will make more and we will all have more; unless some one dumps the product in the Hudson and the Mississippi.

If there are at any time too many miners, leave the mines and go to producing something that it takes coal to produce, and which is in demand. Then you will, in doing that work, furnish a demand for coal that will revive the coal industry. If every one produces less, they will have to get along with less; for what is made is what we have, and what we don't make we don't have. "Do less and have more" is a fallacy.

Only for short periods, when people wilfully refrain from purchasing, are there too many artisans. Immediately thereafter there comes a glut of business; for a large part of what we have done without must eventually be bought, and what was left unbought and undone must largely be bought and done in the years that follow.

Perhaps in time of light demand it might be well to do less. We usually do; we work fewer days in the week or shorter time. But when demand is brisk we still keep up the practice of short-time work and try to take almost as many holidays as we did in the slack season. The result is that we buy less than we need in the slack periods and cannot get what we want and can buy in busy periods. Production is always a little behind the needed level.

A country like Great Britain, with its female percentage increased and its male percentage decreased, is not in prime condition for a shorter day. A country with a lot of cripples is not ready for experiments in the efficiency of shorter working hours. A country that is converting its plants from war work to peace work will not be helped by laboring less industriously.

Every nation has, in certain parts of its career, decried and lamented over-production. Yet year by year the amount of almost everything produced has increased per capita. We want more. Let us work to get it. Goods are not produced by Act of Parliament, but by toil. Still, if goods were producible by the fiat of the

Labor Party in the palace of Westminster, the working-men would not want them because they say: "Away with commodities. They smother us. We are surfeited with them. Do less that we may escape them. The more goods there are the worse our condition is." All of which is nonsense, for the progress of the working classes goes hand in hand with increased production.

### Under-consumption and Over-production

**S**HORT hours and more frequent holidays are a good corrective of over-production whenever over-production occurs. It is a universal practice at the mines. Both operators and miners concur in it. Men are not discharged when business is slow. The same number of men are employed, all are given an equal turn, but the mine is shut down when the coal needed has been loaded onto the cars.

Unfortunately the short working days, which become frequent during these periods of over-production or under-consumption, tend to become the recognized hours for working; and holidays kept one year are likely to be regarded as necessary in the year following. In fact the tendency is to put the shortened hours and shortened time generally into contracts and thus make a binding law out of a mere practice, the provision necessary to meet a temporary condition thus being made obligatory when the condition no longer obtains. The human machine is thus hampered and choked down so that, when business improves and opportunity for steady work presents itself, full days and full weeks of days will not be worked.

An automobile driving through the country is held up at railroad crossings and road crossings. When it reaches the crowded city its progress is stayed at almost every street intersection. How does the chauffeur of the car react to these annoyances? Does he demand a slower car because it is evident he cannot travel steadily at the full speed of his automobile? Not at all. He looks for one that will make the requisite speed between stops and that picks up speed readily. He wants a faster, more responsive machine and not a slower one.

The labor machine is not much different. It is frequently stopped on the road or caused to run slow. It needs all the more to be speeded up between such occasions, for the more delays the more necessity for speed.

The workingman faced by occasional short-time operation should prepare himself to do his utmost when occasion comes. He needs to keep in mind that when slack times end, and times are booming, he should be ready by greater diligence to make up for the time lost. Instead we find a disposition to meet the shortage of opportunity to work by the enacting of crippling restrictions which prevent a large production from being attained when the consumption is large and production cannot possibly supply it without maximum endeavor.

Halts in our progress and signs causing us to slow up, we must expect. Hills there will be that we cannot

take "on high." Curves there will be that we cannot negotiate at full speed. Consequently let us provide a machine, which, run on the level, can bowl along at a lively gait. Rarely is there an economic situation at any time or in any industry such as would assure absolutely steady work. The anthracite industry is now almost the solitary exception, and surely no one would suggest a reduction in output in that industry.

Perhaps the Government may eventually with success provide everyone with work when work is scarce. The suggestion has been made that the Government add this duty to its many other functions. The idea seems good, but having spent a billion or so on roads or schools when times are bad and taxes hard to pay, it will seem good to do the same when times are good and men are scarce, because taxes will be easily collectible. Governments are like the men they represent. They tend to do under one set of circumstances what they learned to do under the necessities of entirely different conditions.

The human mind individually and collectively takes on a permanent set, and the cure for adversity is taken long after the need for it has gone. The drug does its curative work, but the man who has been cured by it becomes an "addict." It would be a bad plan for a man who took cocaine and knew that it sapped his strength to pledge himself to take it indefinitely. It is bad for a union when it knows that shorter hours will hamper production to take on itself to advocate shorter hours indefinitely regardless of the demand of the public for the product of its members.

When the number of hours the members of a union are allowed to work is reduced, then in times of prosperity it is necessary to hire more men. The operator is obliged to go far and wide to secure them. He loads up the industry with labor, and at the next slack time it seems necessary to the miner to reduce the working hours again. As a result hours get indefinitely short, the cost of coal rises, and the consumer, who in the large is only another workingman, suffers. The condition of the miner is not improved. His work is not rendered steadier by the restriction in hours, and never will be. Restrictions in the number of men introduced into the industry is the only real cure, and that violates every law of industrial propriety. Industrial freedom requires that we shall be allowed to work at any job for which we have an ability, provided there is work to do in that line.

### We Want To Get Too Much Out of the War

WE DID NOT enter the war for gain. We did not seek an acre of ground nor did we look for any little thing like a trade concession. It cost us a large loss in money and a far greater loss in lives. Nothing mercenary sullied the help we gave the allies during the war struggle; nevertheless, we are seemingly seeking in peace to gain a little too much out of the war, for when we desire things which are incompatible, we cannot get them, try as we may.

Before the war we were a debtor nation. We are so no longer; the debtor nations are now in Europe. Before the war we had no merchant marine; we are getting a marine service which may eventually outstrip that of Great Britain. Before 1914 Europe went her way without much thought of America; our well-to-do people went to visit Europe, but Europe, quietly self-

satisfied, rarely returned the visit. It is likely that Europeans from now on will regard a visit to the United States as we have regarded a visit to France or Great Britain, as part of a liberal education. These are great gains, but they have their disadvantages.

When the war commenced in Europe that continent partly balanced her bills for what she bought from us (1) by the interest on our debt to her, (2) by the work of her merchant marine for us, (3) by the money expended by visitors to the great European resorts, (4) by the savings of the immigrants in America, sent home by various agents or taken home by the returning immigrant.

With these many ways of paying its bills, Europe was able to accept much merchandise from us and pay for it without sending us goods in return, goods which, to be frank, we did not want and which we tried to keep out entirely by tariffs. The payment by the work of the merchant marine, after once our merchant marine died a natural death from competition and the Civil War, did not introduce any difficulties in our national life. It did not paralyze any of our industries, for we owned no overseas transportation service of any considerable magnitude. We irked under the conditions, first because we had memories of the wonderful merchant marine of earlier days, second because we thought the greatest of nations should have a large mercantile marine, and thirdly, because we believed, probably erroneously, that the European shipowner discriminated in favor of European goods.

But after all, most of us would rather buy transportation of Europe than iron and steel and other products such as are made in quantities in our own factories. And yet it is not material whether we would or would not rather buy transportation than steel; the fact remains that if we will not buy transportation we must buy something else. Bills must be paid. Europe owes us more than we ever owed her, and the interest charge is large and must be paid regularly. If she buys transportation of us instead of selling it, we must accept pay in merchandise; and if Europe repays our visits and spends money here, we shall have to settle for what Europe expends here by the buying of more goods.

There is a new order of things. We play now the rôle of the rich man for whom others labor. Most people like that part in the world's comedy. But nations have a queer way. They do not want others to work for them. The mark "Made in Germany" was gall and wormwood for the Britisher. He could not bear, even before the war, to think of a German splitting blocks of wood for him into match sticks or coating the tips with sulphur and phosphorus or fabricating matchboxes. Nor did he respond otherwise when he read "Made in Sweden." He resented it.

Almost as reasonably might the mine owner object if he saw a car of coal coming out of his mine marked "Mined by John Smith." Would he resent John Smith's mining a car of coal for him? If he did, how long would he be an operator? Is he to feed John Smith and his family? Is he to house him and clothe him without permitting him to mine him a car of coal, at least now and again? Is it not rather his arrogant way to want the said John Smith to mine two cars, so long as he, the operator, knows a way of disposing of the coal and has the money to pay for it?

## DISCUSSION BY READERS

### Accounting of Materials

*Letter No. 3*—The letter of A. T. Lament, dealing with the subject of accounting of materials in mining practice, *Coal Age*, Nov. 21, p. 956, proved very interesting to me, as I have tried for a long time to find a simple and yet foolproof system of keeping track of the labor and supplies of material sent into the mine. I have been particularly desirous of finding a method that would insure charges being placed to their proper accounts, and it is this feature of Mr. Lament's letter that is most helpful.

The strongest recommendation of any system is the fact that it has stood the test of actual use around a mine, and the statement of its author that the system he describes has been in practical use for several years makes it worthy of careful study. A half-baked system is worse than none at all. Recently, so many inferior systems have been advocated that it is a comfort to find a system that has stood the practical test.

In studying Mr. Lament's letter, however, I found, very much to my regret, that he did not enter into the cost of haulage in the mine, in detail. Mine haulage is a subject that is hazy, in the minds of most coal operators, in respect to itemizing the cost. They have found it exceedingly difficult to differentiate between these different items.

#### ITEMS FREQUENTLY CHARGED TO WRONG ACCOUNTS

I am glad to see that the subject of cost accounting in mine haulage is under discussion in *Coal Age* and hope it will evoke some interesting details regarding these costs. Frequently, car repairs are charged to some other account when they properly belong to haulage, and the same is true of locomotive repairs, track repairs, and similar items. At least, that is the way it appeals to me.

About the most difficult item to apportion, however, is the cost of power. This has been referred to in the excellent letter of J. Kenvin, Dec. 26, p. 1175. It is my belief that the cost of power consumed in gathering work should be separated from that required for haulage on the main roads, in order to make an intelligent showing that would assist in securing the greatest economy in these two branches of the work.

I have consulted some of the best authorities on the subject of mine haulage, without arriving at any satisfactory results. The general opinion is that conditions in mines vary so greatly, that it is impossible to devise a system that would be generally applicable for determining these costs.

Although I realize the complexity of this subject, it does not deter me from wishing to place the question squarely before the readers of *Coal Age*. I feel that some of our practical men, experienced in coal-mining practice, will be able to suggest ways out of these difficulties and simplify the seemingly complicated question

of properly distributing mine-haulage costs. We may rightly expect that the average of these suggestions would put us all on the right track to secure greater economy in production.

PROGRESSIVE.

—, W. Va.

### Centrifugal Mine Pumps

*Letter No. 1*—Referring to the reply to the inquiry of "Superintendent," regarding the relative size of suction and discharge pipes and the corresponding openings in a centrifugal pump, which appeared in *Coal Age*, Dec. 5, p. 1049, permit me to say that my experience in installing centrifugal pumps for the pumping of gritty, acid mine water, in the Southern anthracite field and at other points, leads me to differ with the idea set forth that the column pipe into which a centrifugal pump discharges should have a larger diameter than that of the discharge portal or opening.

The use of a column pipe having a diameter larger than that called for by the opening flange in the pump casing may cause serious difficulty if there is an abrupt change from one size of pipe to another. Air would accumulate at this point and, slipping by the column of water, would allow the latter to fall and cause a shock to the impeller and possibly burst the column pipe or do other serious damage.

However, if the increase in size from the discharge opening in the pump casing to the larger size of the column pipe is obtained by introducing a section of pipe with a gradually increasing diameter, which would afford no opportunity for the lodgment of air, little difficulty will be experienced by the use of a larger pipe, either for the suction or for the column pipe than what is called for by the respective flanges.

It is my opinion, however, that no distinct advantage would be obtained by enlarging either the suction or the column pipe. The statement that a 9-in. discharge opening would call for a 16-in. column pipe does not agree with my experience or with manufacturer's ratings. The suction and discharge opening flanges are correct for the suction and column pipes, respectively.

#### PUMPS ARE DESIGNED FOR A GIVEN HEAD

Replying to the second question asked by the correspondent, regarding the effect of a greater or lesser head than that for which a centrifugal pump is designed, let me say that the effect is to decrease the efficiency of the pump, in either case. Operating a centrifugal pump under a *lesser* head than that for which it is designed increases both the discharge of the pump and the horsepower required for its operation. The contrary is the case when the pump is operated under a head *greater* than that for which it is designed. The discharge will then be decreased and a less horsepower will be consumed in driving the pump. But, in either case, the efficiency of the pump is decreased.

To illustrate this point, let me assume a five-stage centrifugal pump running at a speed of 1170 r.p.m. and discharging 1000 gal. per min., under a head of 550 ft. In this case, 200 hp. is delivered at the coupling to the motor and the pump is yielding an efficiency of 72 per cent. This pump has a 6-in. discharge and an 8-in. suction opening in the casing and is provided with a 6-in. column pipe and an 8-in. suction pipe. The maximum head at which a centrifugal pump will operate is dependent upon the peripheral velocity of its impeller.

The pump just mentioned, running at the same speed, will discharge 400 gal. per min. against a head of 665 ft., consuming 180 hp. at the coupling to the motor and yielding an efficiency of 52 per cent. Again, at the same speed, this pump will discharge 1400 gal. per min. against a head of 350 ft., consuming 210 hp. and yielding an efficiency of 55 per cent.

Operated against no head, the same pump will discharge 1540 gal. per min. and consume 230 hp. while so doing, showing no efficiency. Under a head 600 ft., the pump consuming 14 hp., the efficiency is zero and the quantity zero. It is apparent that this pump will operate successfully anywhere between the limits mentioned, but will give the greatest efficiency under the conditions for which it was designed.

#### EFFECT OF CURVING IMPELLER BLADES FORWARD

The remarks just made refer to a centrifugal pump designed with the blades of the impeller curved backward from radial, in the direction of rotation. This is the least efficient way to design a pump, from a power-consumed point of view; but, everything considered, it is the most satisfactory operating unit. An impeller with blades radial or curved forward will cause a serious overload when operating against a head less than that for which the pump is designed.

Regarding the length of suction, as stated in the reply to this inquiry, a long suction is always a distinct disadvantage. A great length of suction might cause the failure of the pump, owing to the inertia of the mass of water in the suction pipe. It may happen that the pump will run away from the suction; or, in other words, pump the water from the casing quicker than the partial vacuum, owing to the drag in the suction pipe, can replenish the space vacated by the water pumped.

When starting a centrifugal pump having a long suction, a very perceptible period of time is required to accelerate the mass of water in the suction pipe and give it a velocity that will supply the pump or equal its discharge. In that case, a void space is formed between the water in the suction pipe and the water in the pump. The pump will then suck air, which reduces the vacuum, and the operation of starting must be repeated. For this reason, the discharge valve in the column pipe should always be closed when starting a centrifugal pump.

WM H. GRADY,

Pottsville, Penn.

Consulting Engineer.

[The exception taken by this correspondent to the statement made in the reply to the inquiry to which reference has been made is not supported by the statements and practice of the leading manufacturers of centrifugal pumps. While it goes without saying that an expanding section of pipe is required to connect the discharge opening of a centrifugal pump with the larger size of the column pipe, it is an unquestioned

fact in all pumping practice that there is a large saving in power when the velocity in the column pipe is moderately reduced, say to 6 or 8 ft. per sec.

On the other hand, the high velocity of discharge of water from the pump casing demanded by the high speed of the impeller of a centrifugal pump calls for a considerable reduction of this velocity after passing the discharge portal and before entering the column pipe leading to the surface. This reduction of velocity is, of course, to be made gradually by an expanding section of pipe, as explained.

The following are brief quotations from the publications of three of the leading manufacturers of centrifugal pumps:

It is advisable to make suction and discharge piping one or two sizes larger and connect same to the pump, by means of an increaser. There is a decided advantage in doing this, for it effects a saving in power at the mines or a gain in pressure and an increased suction lift if necessary.

Another manufacturer states as follows:

The suction and discharge pipes should be selected several sizes larger than the suction and discharge openings of the pump. The suction line should be carefully laid so as to avoid the possibility of the formation of air pockets in the same.

Still another manufacturer states the following:

As a rule, a velocity of 6 to 8 ft. per sec. should not be exceeded in piping, as a higher velocity is apt to result in excessive friction loss. It is also true that seldom, if ever, should the piping be installed of the same size as that of the outlet or inlet of the pump. Centrifugal pumps must necessarily have a high velocity through the casing, in order to obtain a high efficiency; and, thus, the size of the openings of a properly designed centrifugal pump is no gage whatever of the proper size of the piping to be attached to them. The only correct method of determining the pipe size is one which includes a careful analysis of the velocity of the water through the piping, length and character of the piping, number of fittings, bends, etc.

Our thanks are due this correspondent, however, for his remarks regarding the effect of a greater or lesser head than that for which a centrifugal pump is designed. As he has stated, there is always a loss of efficiency when a centrifugal pump is operated under a lesser or a greater head than that for which it is designed. In designing a pump to give a desired discharge, the greatest efficiency can only be secured when the discharge is proportionate to the square root of the head. In other words, in respect to securing the highest efficiency, this type of pump is subject to limitations regarding the ratio of the discharge to the square root of the discharge head.—Editor.

#### Portable Coal Loaders

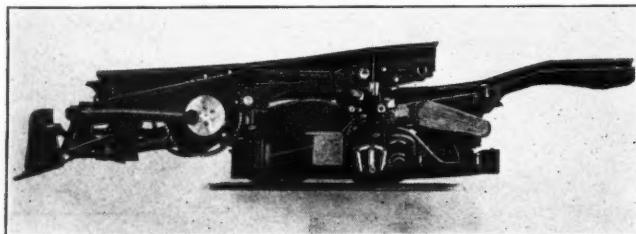
Letter No. 2—Speaking of portable coal loaders, to which recent references have been made in *Coal Age*, and referring particularly to the inquiry of "Operator," Nov. 21, p. 961, kindly permit me to draw attention to still another type of this class of machinery worthy of mention. I refer to the Halby shoveling machine, designed for underground shoveling and loading, Lake Shore Engine Works, Marquette, Mich.

Having seen this machine in operation at Braznall, Penn., and at North Fork, W. Va., and knowing that it is doing good work and giving satisfaction in each case, I thought that many of the readers of *Coal Age* would be glad to know a few facts regarding the value of this class of equipment in coal mining.

The Halby machine is built in three types, varying from 7 to 10 tons in weight. The machine is built to operate on any track gage and uses either compressed

air or electricity, as desired, although electrical operation of the machine is recommended. The electrical machine is ordinarily equipped with a 25-hp. motor. The trucks are mounted on Hyatt roller bearings and a worm drive is provided, by means of which the machine is self-propelled. All parts of the machine have been designed to withstand severe service.

In the accompanying figure is shown the machine known as the "T700" machine, which has an overall length of 23 ft. 4 in., an overall width of 4 ft. 8½ in. and an overall height of 4 ft. 6 in., being designed especially for operating in 5-ft. coal. Another model, the "T600," has an overall length of 23 ft. 2 in., a width of 5 ft. 2½ in. and an overall height of 5 ft. 10½ in. The widths given do not include the operator's



THE "HALBY" SHOVELING AND LOADING MACHINE

platform, which extends 10½ in. on the right or left side of the machine, as desired.

The power and truck sections, which are separate units in the T700 model, are combined in the T600 model. Also, the rear conveyor, in the former machine, is arranged to discharge its material, either into a car standing on the same track or on a track parallel with that on which the machine is operated. The T600 model can discharge its material only into a car standing on the same track, behind the machine.

There is no limit to the size of the coal handled by these machines, except the limitation imposed by the headroom in the mine where the machine is operated, since the material must pass over the top of the conveyor, under the roof. Lumps weighing 1500 lb. are readily lifted in the dipper or scoop of the machine, transferred to the rear conveyor and loaded into the car waiting to receive the material. These facts should be of interest to all coal operators.

OBSERVER.

Pittsburgh, Penn.

## Specific Gravity Determination of Coal

*Letter No. 1*—Kindly permit me to add a word to my previous article, which appeared in *Coal Age*, Dec. 12, p. 1078, on the determination of the specific gravity of coal by a rapid method that gave practical results. While the process then described is correct, I have since found that the following slight modification is of advantage when but a few samples of the coal are to be handled in the determination:

After the 100 c.c. of water has been added from the pipette and the flask has been shaken, more water is added, as previously described, at the bottom of the second column, page 1078. But, before the flask is filled to the mark, 5 c.c. of oil is added from a small pipette. This 5 c.c. of oil must be accurately measured

and is, therefore, best added from a 5-c.c. "delivery pipette," or, if desired, a "capacity pipette" may be used. In that case, however, the same pipette should be used in calibrating the flask. After adding the oil, fill the flask to the mark with water, and calculate the results as described before.

A. G. B.

Pottsville, Penn.

*Letter No. 2*—In the article by A. G. Blakeley, published in *Coal Age*, Dec. 12, p. 1078, attention is directed to the possibility of quickly estimating the approximate percentage of ash, in commercial samples of anthracite coal, by determining the specific gravity of an average sample.

Mr. Blakeley describes simple and excellent methods for such determinations, and gives interesting data covering 119 samples of coal, all of which were taken from one colliery. These data are quoted in illustration of the relation of ash to specific gravity, and from the figures given the specific gravity of "ash-free coal" can be calculated.

For example, using the figures given by Mr. Blakeley, in different combinations, we may calculate the specific gravity of ash-free coal as follows:

	Specific Gravity	Ash Per Cent.	Sp. Gr. "Ash-free" Coal (Calculated)
Chestnut.....	1.61	12.89	
Rice.....	1.75	26.24	1.4748
Buckwheat.....	1.67	18.27	
"Boiler fuel".....	1.86	35.86	1.4726
Chestnut.....	1.61	12.89	
"Boiler fuel".....	1.86	35.86	1.4700
Average.....			1.4725

The remarkably close agreement shown by these figures prove the determinations quoted by Mr. Blakeley were made with great care and accuracy. The same figures, if similarly used to calculate the specific gravity of the ash content, show that the average specific gravity of the ash is surprisingly high, being about 2.55 to 2.56. Possibly the presence of an unusually large quantity of pyrite in this particular coal may account for the apparently high gravity of the ash.

### DIAGRAMS OF ANTHRACITE AND BITUMINOUS COAL

An article in the February, 1918, Bulletin of the American Institute of Mining Engineers and a similar article published in the August, 1918, Journal of the Engineers' Club of Philadelphia, contains a diagram that I prepared to illustrate the relation of the specific gravity of bituminous coals to their percentages of ash and sulphur (pyrite). Had the data been available at that time, I should have prepared a similar diagram to show a like relation as existing between the specific gravity and ash of anthracite coals. Mr. Blakeley's paper furnishes the data from which such a diagram can readily be constructed.

It would be seen, at once, that these diagrams are remarkably similar. The bituminous-coal diagram shows an increase of 1.46 — 1.25 = say 21 points, in specific gravity, corresponding to an increase of 20 per cent. in ash content; or  $21 \div 20 = 1.05$ , for each per cent. increase in ash.

Similarly, the figures from which an anthracite diagram can be drawn show, in one instance, an increase of 1.75 — 1.4725 = 27.75 points, in specific gravity, as corresponding to an increase of 26.24 per cent. of ash; or  $27.75 \div 26.24 = 1.057$ , for each per cent.

In another instance, the anthracite figures show an increase of  $1.86 - 1.4725 =$  say 38.75 points, in specific gravity, as corresponding to 35.86 per cent. increase in ash; or  $38.75 \div 35.86 = 1.081$ , for each per cent. increase in ash content.

It will, of course, be understood that an anthracite diagram prepared from this data will not be applicable to coals of lighter specific gravity, such as those of the Scranton-Wilkes-Barre district in which the specific gravity of ash-free coal is probably about 1.38; but the ratio of increase in specific gravity, for each increment in the percentage of ash, remains approximately the same as that given above; namely, from about 1.057 to 1.081, for each increase of 1 per cent. in the ash. As a ready means for quickly and approximately calculating the ash from the specific gravity, or vice versa, Mr. Blakeley has used the factor 1, which is sufficiently accurate for ordinary purposes.

#### DATA MUST CORRESPOND TO THE QUALITY OF COAL

Objection may perhaps be made to this method of determining the specific gravity of ash-free coal, on the ground that the figures given by Mr. Blakeley represent the specific gravity of a mixture of coal and slate, rock, bony coal and other impurities existing in anthracite, as prepared for shipment, or for local use.

By the methods in use, it is impossible to remove all of the slate and rock from coal shipments. It would be contrary, moreover, with proper regard for the conservation of our fuel supplies, to remove all of the bony coal, because most of this grade has a relatively high thermal value. It is entirely possible, however, that the impurities constituting the ash of the coal may not be of the same specific gravity as that of the slate, which is mechanically mixed with the coal. When that is the case, of course, the specific gravity of the ash-free coal is not 1.4725, and other data must be used.

While it will certainly be understood that there can be no such thing in nature as "ash-free" coal, yet the specific gravity of such basic coal must be the imaginary starting point of diagrammatic curves, useful both for laboratory and commercial purposes. Data bearing on such assumed basic coal is therefore useful, important and valuable. Unfortunately there are few published data available for reference. Richard's treatise on Ore Dressing gives the specific gravity of anthracite (the ash not stated), as varying from 1.32 to 1.70, and other reference books are equally vague.

To determine accurately the specific gravity of so-called "ash-free" coal, in each of the anthracite districts, it would seem necessary to have a series of determinations of the average specific gravity and ash percentage of: (1) High-grade (very low in ash) hand-picked samples; and (2) low-grade (high in ash) hand-picked samples. Such samples should include no slate or rock, or coal that could be classed as bony coal. From these two sets of determinations, it would then be possible to calculate the specific gravity of the impurities of the coal that constitute the ash and the specific gravity of a basic "ash-free" coal for the district or coal bed from which these samples were secured.

The publication, by Mr. Blakeley and other chemists engaged in anthracite coal work, of data of this nature would be a valuable contribution to our knowledge, in a field that seems to have been almost entirely neglected.

This subject is of further interest in its relation to the question, often asked but never conclusively answered, "What is coal?" Is it a mechanical mixture of carbon, clay, silica, etc., containing condensed or entrained gaseous, hydrocarbon compounds; or are some or all of the hydrocarbon and other gaseous elements chemically combined with the carbon of the coal; or are some or all of the constituents of the ash chemically combined with the carbon or the hydrocarbon constituents?

In connection with the development of the coal-washing method invented by Thomas M. Chance, which effects the complete removal of slate and rock, by the flotation of the coal and bony coal, a series of determinations of the specific gravity of commercial grades of anthracite have been made. Many of these determinations were checked by using chloride-of-zinc solutions, the specific gravity of which was accurately fixed. Most of these determinations were made on coals coming from the southern and middle anthracite fields.

As the efficiency of the Chance method depends entirely upon differences in the specific gravities of coal and bony coal, on the one hand, and slate and rock, on the other, the difference in the specific gravities of the coals from the southern and the northern districts was carefully noted, in order to adjust the specific gravity of the fluid mass required to make a perfect separation. The results we have obtained are generally in substantial agreement with the much larger number of determinations given by Mr. Blakeley in his article; but, as already stated, these results cannot be applied to the lighter coals of the northern districts.

Philadelphia, Penn.

H. M. CHANCE.

The following is the method of calculating the specific gravity of ash-free coal and of the ash, respectively, as explained by Mr. Chance, at our request:

	Specific Gravity	Ash Per cent.	Ash-free Coal Per cent.
Chestnut	1.61	12.89	$100 - 12.89 = 87.11$
Rice	1.75	26.24	$100 - 26.24 = 73.76$

Calling the specific gravity of ash-free coal  $x$ , and that of the ash  $a$ , considering a unit weight of each of these grades of coal, we write

$$0.8711x + 0.1289a = 1.61 \quad (1)$$

$$0.7376x + 0.2624a = 1.75 \quad (2)$$

Combining these two equations to eliminate  $a$ , and finding the value of  $x$ , we have

$$x = 1.4748$$

Similar calculations for buckwheat and boiler fuel give  $x = 1.4726$ ; and for chestnut and boiler fuel,  $x = 1.4700$ . The average of the values gives for the average specific gravity of ash-free coal, for this quality of anthracite, as  $x = 1.4725$ .

Again, solving equations (1) and (2), with respect to  $a$  gives for the average specific gravity of the ash, for this quality of anthracite,  $a = 2.55$ .

## Reducing Ventilation at Firing Time

*Letter No. 2*—The question of reducing the circulation in a mine, at the time of firing, has again been brought to the attention of readers, by the letter of John Verner, *Coal Age*, Nov. 28, p. 1000, in which he urges once more the importance of the air factor in producing explosive conditions in mine workings.

It would seem in this, as in all other practices in coal mining, both operators and miners are prone to stick to the old methods with which they have been long acquainted. It will take some time to convince many mining men that their fans should be shut down, or at least slowed down, before shots are fired in the mine. Others, who have been forced to adopt this practice, will be just as hard to induce to go back to the old system.

In some mining districts, the practice of reducing the circulation of air in a mine when firing has been adopted and followed for a considerable time. Other districts have made no change in the quantity of air in circulation, while in still other districts the practice is to increase the circulation by speeding up the fan when the time for firing shots has arrived. It would seem, therefore, that mining men do not have a common understanding of what is the safest method to pursue.

There is a mine, in Indiana, that has had the practice of shutting off the circulation when firing and, in that mine, a number of accidents have occurred from blown-out shots. In other mines in the same field, the ventilation has been unchanged at firing time, and it is worthy of note that fewer accidents have happened in those mines than in the one just mentioned. This is not necessarily, of course, to be attributed to the practice of reducing the ventilation in the mine first named. The frequency of accidents in that mine may have been the result of improper practices in drilling and blasting the coal.

#### BAD PRACTICES IN BLASTING COAL

At some mines in southern Illinois, it was no uncommon thing, a few years ago, for explosions to occur as often as once or twice a week. Some of these were very severe while others were not so bad. These explosions, however, were caused by the excessive use of powder in blasting, and locating the charge too far on the solid. It was nothing unusual there, at that time, for miners to drill their holes from 8 to 10 ft. in depth, which would invariably put the charge on the solid, where it would have no opportunity to perform its work, and the result would be a blown-out shot. One of these shots was reported as 12 ft. deep and measuring 6 ft. on the heel and 12 ft. on the point. But it was not fired, as it would undoubtedly have caused another explosion.

Mr. Verner's contention, I believe, is that the circulation in a mine should only be reduced where there is no danger from the accumulation of gas. It would seem advisable that the circulation should be reduced in a dusty mine, at firing time, in order to reduce the quantity of dust floating in the air. But, where a mine is generating gas in quantities that would produce a dangerous accumulation during the period of firing, unquestionably, the circulation should remain unchanged. Any interference with the ventilation, in such a mine, would be dangerous.

Although I have had no experience in gaseous mines, it is my belief that the question of reducing the ventilation at firing time is limited to mines not producing gas in dangerous quantity. As this question is an important one, I hope to see it discussed from different viewpoints, by men who have had experience both in gaseous and dusty mines and in mines generating no gas or dust.

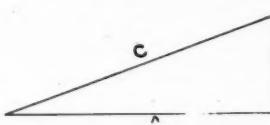
Cleaton, Ky.

OSTEL BULLOCK.

#### Estimating Percentage of Grade

*Letter No. 2*—Referring to the letter of Joseph R. Thomas, *Coal Age*, Nov. 21, p. 959, permit me to say that the method he mentions of estimating the percentage of grade based on horizontal measurement is simple enough, but does not apply to cases where the percentage of grade is referred to pitch measurement.

Kindly permit me to give two methods that I have used in calculating the percentage of grade referred to pitch measurement. The first is as follows: In the triangle  $ABC$ ,  $A$  is the horizontal distance corresponding to the pitch measurement  $C$ , and  $B$  is the rise of the incline for that distance. It is evident that, since this is a right triangle, the hypotenuse  $C$ , representing the pitch distance, is equal to the square root of the sum of the squares of the horizontal distance  $A$  and the rise or difference in elevation  $B$ , as expressed by the formula



THE INCLINED PLANE

$$C = \sqrt{A^2 + B^2} \quad (1)$$

But the percentage of grade when based on pitch distance is equal to the difference of elevation between two stations divided by the distance measured on the pitch between those stations. Therefore, calling the percentage of grade  $x$ , this is expressed by the formula,

$$x = \frac{B}{\sqrt{A^2 + B^2}} \quad (2)$$

Following is the second method: Referring, again, to the triangle  $ABC$ , since the percentage of grade referred to pitch distance is equal to the rise  $B$  divided by the pitch distance  $C$ , it is expressed by the sine of the pitch angle or the angle of inclination of the plane, which is the angle formed by the lines  $A$  and  $C$  in the figure. Therefore, knowing the difference in elevation between two stations and the horizontal distance between them, as given on the mine map, the first step is to find the pitch angle. The tangent of this angle is equal to the difference in elevation divided by the horizontal distance between the stations, measured on the map.

$$\tan a = \frac{B}{A} \quad (3)$$

Reference is then made to a table of sines and tangents, in order to find the sine corresponding to this calculated tangent.

For sake of illustration, assume the horizontal distance between two stations, as taken from the mine map, is  $A = 400$  ft., and the difference in elevation, 30 ft. Then, estimating the percentage of grade by the first method given, substituting these values in Equation 2, we have

$$x = \frac{30}{\sqrt{400^2 + 30^2}} = \frac{30}{401} = 0.074, \text{ or } 7.4 \text{ per cent.}$$

Again, making the same calculation by the second method given, substituting the same values in Formula 3, we have

$$\tan a = \frac{30}{400} = 0.075$$

The angle corresponding to this tangent, as taken from the tables, is  $4^\circ 17'$ , and the corresponding sine of this angle is practically 0.074, which makes this grade 7.4 per cent., as before.

Let me suggest, here, that it is not necessary, as Mr. Thomas states, to calculate the pitch distance by dividing the distance on the map by the cosine of the angle of inclination. Although, in the case I have assumed, there is slight difference between the tangent and the sine of the pitch angle, this difference is greater as the angle of inclination is increased.

West Pittston, Penn.

RICHARD BOWEN.

## INQUIRIES OF GENERAL INTEREST

### Smoky Coals

Please say why soft or bituminous coal makes a much darker smoke when burning than anthracite.

Wilkes-Barre, Penn.

STOKER.

Bituminous coal contains less fixed carbon and much more volatile matter, consisting largely of hydrocarbons and tarry substances that are not consumed in the furnace and escape with the gases produced by the combustion of the coal. It is these solid particles of unburned carbon that form the darker smoke of bituminous coal.

### Safeguards in Trolley Haulage

Kindly explain the simplest and best method of protecting the trolley wire in mine haulage, so as to avoid accidents from men and animals coming in contact with the wire and receiving a shock that might prove fatal. We are using a 250-volt, direct-current circuit for haulage in our mine.

Also, explain how the trolley wire should be arranged so as to avoid its crossing room necks, where trolley locomotives are used on gathering hauls.

Bicknell, Ind.

MOTORMAN.

Probably the simplest method that can be employed to safeguard a trolley wire, in mine entries, is to protect it at all points where men and animals must pass under the wire, by suspending light boards on each side of and parallel to the wire, at such points. The boards should be 1 x 6 in. and supported by strong hangers of strap iron secured to the roof by expansion bolts driven into holes drilled for that purpose.

The boards should extend an inch or two below the trolley wire and be spaced about six inches apart. When properly arranged they offer no obstruction to the passage of the trolley, but furnish ample protection against accidental contact with the wire owing to neglect or careless indifference to the danger. Sometimes the boards are made to swing, by hanging them on eyebolts, but that is not essential.

Trolley wires should be hung on substantial insulated supports, and follow one side of the track only. The wire should hang about 6 in. outside of the rail, on the side of the track opposite to that where clearance is provided for the necessary passage of men in the performance of their duties in the mine.

The use of old rubber hose, where this is available, has been suggested as being an excellent substitute for boards, for the protection of trolley wires at crossings where men and animals must pass. A sufficient length is first cut from the old hose and then split open and hung in place of the boards. The rubber being pliable and a good insulator is forced up against the trolley wire by anything striking it and insures perfect insulation from the current.

In electric haulage, nothing is of greater importance than that the installation be made by a competent mine electrician—that is to say, an electrician who has had experience in coal-mining practice and understands the conditions that surround the work in the mine. Only such an one is competent to decide what safeguards are necessary for the protection of the workers and to provide practical appliances.

In answer to the second question asked, let it be said that where trolley wires are hung on producing entries the wire should be carried on the opposite side of the entry from that on which the rooms are turned, except where it is impracticable to make such arrangement. Only in exceptional cases should a trolley wire be carried across the mouth of a room, and then it must be properly guarded.

Locomotives equipped with two trolley poles have been used in some mines, which make it possible to take power from either side of the entry. In that case, the trolley wire could be transferred from one side of the entry to the other with slight inconvenience. The use of such a 2-pole locomotive would obviate the necessity of carrying the trolley wire across the mouths of the rooms.

### Coal Resources of Germany

Will *Coal Age*, or some of its readers, kindly inform us what are the coal resources of Germany? Have any large additional coal reserves been discovered recently; and, if so, where are they located? At the present time, this question should be of particular interest to all interested in the future development of the coal trade throughout the world.

LIGNITE.

Mont.

The question asked by this correspondent has, indeed, an interesting bearing on coal-trade development following the great war. Some of the most valuable of the coal deposits of Germany are located in the Alsace-Lorraine territory, which the Germans took from the French in 1870 and which now falls, again, into the possession of France, as a result of the recent allied victory.

Little information is available in regard to any recent discoveries of coal deposits in Germany. The latest publication bearing on the coal resources of Germany is that given in the report of the Executive Committee of the Twelfth International Congress, Vol. 3, entitled "The Coal Resources of the World." This report, which is wholly in German, can be found in the leading libraries. It was issued in 1913, the year previous to the outbreak of the war.

Probably some of the readers of *Coal Age* can furnish facts or offer information that will be of interest in reference to the coal deposits of the Central Empires, and their present and prospective development.

## EXAMINATION QUESTIONS

### Miscellaneous Questions

*(Answered by Request)*

**Ques.**—In a mine giving off 2500 cu.ft. of marsh gas per minute, the volume of air entering the intake opening is 4,000,000 cu.ft. per hour. What is the percentage of gas in the return current? Would you consider this percentage of gas dangerous?

**Ans.**—The circulation, in this mine, is  $4,000,000 \div 60 = 66,666$  cu.ft. per minute. The total volume of air and gas passing in the return airway is, therefore,  $66,666 + 2500 = 69,166$  cu.ft. per minute, and the percentage of gas in this return current is  $(2500 \div 69,166)100 = 3.6$  per cent.

This percentage of gas is far too dangerous under any mining conditions, and immediate steps should be taken to withdraw the men and improve the circulation in the mine.

**Ques.**—When air splits are necessary in mines, how would you determine their limit of usefulness?

**Ans.**—The practical limit to splitting air currents in mines is determined by the resulting velocity of the air passing the working faces. Under ordinary conditions, this velocity should not fall below 3 or 4 ft. a second. If the mine is generating gas, the velocity of the air current must be sufficient for the removal of the gas and prevent its accumulation in pockets in the roof or in other void places. The necessary velocity of air in mine workings depends much on the pitch or dip of the seam.

**Ques.**—What is the breaking strain of a good steel hoisting rope  $1\frac{1}{2}$  in. in diameter?

**Ans.**—The breaking strain of a 6-strand, 19-wire, steel hoisting rope is found by multiplying the square of the diameter in inches by a constant depending upon the quality of the steel. This constant for ordinary cast steel is 34; for crucible cast steel, 39; and for plow steel, 44. These constants represent the breaking strain of a 1-in. rope of each respective quality of steel. Therefore, the breaking strain of a  $1\frac{1}{2}$ -in. crucible cast-steel rope, having 6 strands of 19 wires each, is

$$S = 39(1\frac{1}{2})^2 = 87\frac{1}{4} \text{ short tons.}$$

**Ques.**—Why is afterdamp a variable mixture?

**Ans.**—The composition of the afterdamp of an explosion of gas in a mine will vary with the percentage and the kind of gases in the firedamp mixture before the explosion. The character of the afterdamp will also depend on whether or not dust took part in the explosion and what amount of dust was present, and the quantity of air in circulation. These are the principal conditions affecting the completeness of the explosion and the character of the gases forming the afterdamp.

**Ques.**—A rectangular collar 10 in. deep supports 3000 lb.; what will it support if its depth is increased to 12 inches?

**Ans.**—Assuming this collar is uniformly loaded and supported at both ends, the load it will support varies

as the square of the depth of the collar or beam, the width of the beam remaining unchanged. Calling the maximum safe load, for a depth of 12 in.,  $x$ , we have  $x: 3000; 12^2: 10^2$ ; and,  $x = (3000 \times 144) \div 100 = 4320$  pounds.

**Ques.**—If the quantity of air in the downcast weighs 1800 lb., the depth of the shaft being 300 ft., and the difference of weight of air in the shaft is 250 lb., what will be the length of the motive column?

**Ans.**—In replying to this question, it must be assumed that the reference here is to two shafts of equal depth, sunk from a level surface. It is also assumed that the shafts are of the same size in cross-section, and that, while the weight of the volume of air in one shaft is 1800 lb., that of an equal volume of air in the other shaft is 250 lb. more or less than that amount. On this basis, it may be calculated that the weight of air in the first shaft is  $1800 \div 300 = 6$  lb. per foot of depth. Then, the difference in weight of air in the two shafts being 250 lb., the length of motive column, under the assumed conditions, is  $250 \div 6 = 41\frac{2}{3}$  feet.

In mine ventilation, the motive column producing a circulation of air is calculated by dividing the pressure producing the circulation, expressed in pounds per square foot, by the weight of a cubic foot of the air, which gives the corresponding motive column, expressed in feet.

**Ques.**—What would you consider was the cause of a flame traveling down a 100-ft. room and out on the entry, when a shot was fired at the face of said room, and what remedy would you apply to prevent danger?

**Ans.**—Such an occurrence points to the probable existence of an inflammable atmosphere in the room, caused by the presence of gas or dust or both. The gas- and dust-laden air, ignited by the flame of the shot, causes a local dust explosion at the face of the room, and the consequent projection of the flame from the mouth of the room onto the entry. The same result is also caused, at times, by the occurrence of a blown-out or windy shot exploded at the face of a room. In the presence of gas or dust, such a shot will invariably produce a local explosion and a large volume of flame will be projected from the mouth of the room, unless the force of the explosion is exhausted before it reaches that point.

In order to prevent such occurrences, strict regulations must be made and enforced in regard to blasting the coal. All holes drilled must be properly mined or sidecut, and no holes permitted to be located or drilled to such a depth that the charge will be placed on the solid. Every hole should be inspected before it is charged, and the weight of the charge limited to a specified amount. The best plan to pursue is to employ shotfirers whose duty is to inspect, charge, and fire all holes that in their judgment are safe. Care must be taken that no shots are fired in the presence of gas, and all accumulations of dust at the face avoided.

## COAL AND COKE NEWS

### Harrisburg, Penn.

The fact that the Pennsylvania Railroad Co. is demanding and receiving from the mines on its lines east of Pittsburgh 1152 cars of coal a week, which is commanded by the Pittsburgh fuel administration officials and turned over to it, is causing complaint from operators, byproduct concerns, mills and manufacturers. The coal commandeered by the railroad is of the metallurgical grade, used for coke, byproducts and manufacturing purposes generally. Little of this coal is of the steam variety, and the operators say that it should not be used for steam-making purposes by the railroad when it is so badly needed for metallurgical consumption.

The Fuel Administrator at Pittsburgh has stated that the operators are right in their complaint, and that the Pennsylvania R.R. has positively refused to accept coal for its engines from any source except the mines on its lines. This means that it will not accept coal from the Pennsylvania Lines West. The fuel administrator says in other words, "The Pennsylvania R.R. will not pay a freight rate of 65c. a ton. For this reason, I am furnishing the company 1152 cars of coal a week directly from mines along its road, much of it coming from the mines on the Pittsburgh, Virginia & Charleston division. It is the order of the Federal Fuel Administration, and all I can do is to obey. In my opinion it is neither right nor fair to the operators or the coke and byproduct concerns who badly need this grade of coal. But I am powerless."

Governor-elect William C. Sproul will be asked to incorporate in his inaugural message a recommendation for serious consideration by the Legislature of a proposition for state health insurance. This is among other sociological problems that will command attention of the state lawmakers this year. The success of the Workmen's Compensation Act and other humanitarian acts, it is declared, has convinced the larger interests that health insurance should be seriously considered.

In order to learn health conditions and the need for aid in the bituminous coal fields of this state, an investigation was made for the Health Insurance Commission in October, in Fayette, Washington, Westmoreland and Somerset counties. In the families of miners health conditions were found very poor. Prenatal care was virtually unknown; infant deaths were high, the rate in Fayette County being 160 per 1000 living births. Deaths from children's diseases were high. The commission found it interesting to note the contrast between the lack of care for the sick and the elaborate systems maintained by the coal companies to handle accident cases.

### Charleston, W. Va.

Until Christmas week the car supply in the Fairmont region had been away below par, and just at a time when cars were needed. But during Christmas week, for some reason or other, the supply took a sudden spurt, and empties began to accumulate, with a supply of over 2000 on hand the first day of the week. Despite the Christmas holidays and a general tendency to suspend operations, much coal was loaded, everything considered. This was necessary owing to the fact that some of the larger companies had got behind with their orders, and also because of a steady demand from the Reading and other Eastern roads for railroad fuel. More miners are needed in the Fairmont field. Taken as a whole, the demand for Fairmont coal is rather brisk at this time—much more so than would naturally be expected.

Production in the Kanawha district has sagged considerably, yet not below, or at least not much above, the demand. An extremely quiet market is looked for until toward the end of January, and in the meantime operators are marking time. There was, however, during the week ending December 28, so far as reported, a total tonnage output of 42,065 tons.

"No market" crept into the last report of production in the Pocahontas and Tug River districts, and a loss of 3577 tons is shown from that cause alone out of a total tonnage loss of 97,992. It was also ap-

parent that a car shortage was cutting down production, since a loss of 46,950 tons was sustained through that cause alone. The total output was only 360,567 which is the lowest figure for the year. Some of the mines in the Pocahontas field have cut down their operations to three days a week. It is stated that only a few days ago there were 5000 unreconsigned coal cars loaded between Bluefield and Cincinnati. The western boundary for the shipment of Pocahontas coal has been extended to include Cincinnati. Operators in the Pocahontas field are inclined to believe that the present lull will be of short duration.

Inability to secure ship facilities has caused a reduction of the output of the New River district. Embargoes have been in effect since Dec. 19 on tidewater coal, and the number has been considerably augmented since that time so that little or no coal is going to the seaboard. At the last of the year the market for New River coal is far below normal.

Deep dents were cut in the output of the Guyan region during the last week of December principally because of no market for the coal of the district, the loss from such a cause being 140,432 tons, or 54.68 per cent. of the total full time capacity of the district, the production loss, all told amounting to 72.44 per cent. of the total full time capacity or in tons 186,044, leaving a production of only 70,781 tons or 27.56 per cent. The "no market" loss reflects the generally unsatisfactory market conditions.

### Birmingham, Ala.

A slight falling off in the coal output of the Alabama district is reported for the past week, due to holiday celebrations. The production for the last month of the year 1918 has not been satisfactory. For the week ending Dec. 7 the output was 381,065 tons; for the week ending Dec. 14, 387,430 tons, and for the week ending Dec. 21, 367,632 tons. There is still unsteadiness in labor, but the influenza epidemic is about over. There is hope that the return of men from the cantonments and army camps will alleviate the situation to a great extent. The pinnacle of production was reached the week ending Aug. 24, when 430,311 tons were mined.

Coal men of the district are optimistic regarding the operations of the next few months, and, in fact, the entire year. They state that the demand for all kinds of fuel will not be met for months to come. Coke production is still far under the demand. Producers and dealers in coke say that good prices obtain and that there is a ready market for every ton that can be supplied.

### Seattle, Wash.

Considerable activity is manifested in the coal regions of Alaska, now that the Government railroad is completed to practically all the more important districts. The Alaskan Engineering Commission recently let contracts for the delivery of 6000 tons of Nenana coal from properties recently opened on the line of railroad, 29 and 44 miles south of Nenana. This marks the beginning of real development in Alaska's vast interior coal fields.

One hundred tons of coal are being produced daily at the Eska mine, in the Matanuska coal fields, by the Alaskan Engineering Commission, which is employing about 150 men at this place. The commission is also employing about 40 men in development work at Chickaloon. This is the property from which the coal, secured and tested by the United States Navy, was found to be the equal of Pocahontas coal for steaming purposes. The Chickaloon Coal Co. is actively pushing drilling and other exploration work on its lease area, adjacent to Chickaloon. The Bering Coal Co. has taken a lease in the Bering coal fields and has a large force engaged in extensive development work.

The Alaskan Anthracite R.R., under construction from Comptroller Bay to the coal property of the Alaskan Petroleum and Coal Co., was completed to tidewater on Bering River, Oct. 7, 1918. It is planned next season to extend this railroad seven

miles from Okalee channel on Comptroller Bay, which will permit direct loading on to ocean carriers.

#### PENNSYLVANIA

##### Anthracite

**Natalie**—Madeira, Hill & Co. are improving this mining village by the addition of a number of miners' houses, built of cement blocks.

**Lansford**—The Lehigh Coal and Navigation Co. will soon begin the stripping of the overburden on a large track located between Summit Hill and Lansford.

**Bethlehem**—The official employees of C. M. Dodson & Co., Beaver Brook, Locust Mountain Coal Co., Shenandoah, and some former employees of Morea Colliery, together with the "soft coal" officials of Weston, Dodson & Co., were entertained by General Manager J. B. Connell in the firm's new office building, recently placed in service at this place. Addresses were made by the heads of departments and by two returned heroes of the war.

**Hazleton**—December was a rainy month. Many collieries were hampered by high water. At the No. 21 slope of the Lehigh & Wilkes-Barre Coal Co., the pumping plant failed and men and mules were hastily withdrawn to avoid an accident. The many "worked out" stripings on the Lehigh & Wilkes-Barre, Honey Brook division, make the handling of water a serious matter.

Rents of employees' homes on the O. B. Markle Co. property, which were reduced one-half during the war, were placed at the original figure beginning Jan. 1.

#### Bituminous

**Pittsburgh**—The Pittsburgh Coal Co. has contracted with the Roberts & Schaefer Co. for a Marcus screen to be installed in the Montour No. 10 tipple.

#### WEST VIRGINIA

**Bell**—The Carter Coal and Mining Co., having erected its own power station in connection with its plant at this place, will put the new plant in commission within the next few days.

**Madison**—The Spruce River Coal Co. contemplates within the near future a number of improvements at its plant near here and among other things has provided for the installation of a 2200-volt transmission line.

**Omar**—The Main Island Creek Coal Co. has recently completed its new store and Y. M. C. A. building at its Barnabas plant. The building was designed by Mr. Martin, who is manager of the company's operations at Amherstdale, W. Va. The cost of construction and equipment was approximately \$75,000, and no pains nor means have been spared to make the building complete.

**Welch**—The bodies of Fred Paulick and Martin Verseska, the two men who were killed in the Havaco mine explosion Saturday morning, Dec. 21, have been found and were brought to Welch to be prepared for burial. The theory has been advanced that a door leading into the mine passage had been left open, and gas accumulated, and when the electric motors went in they made sparks which set off the gas, causing the explosion. The damage done to the mine has not been estimated, but it is placed at a considerable figure.

**Williamson**—James Hatcher, one of the best known men of Pike County, Kentucky, began breaking ground on his mineral lands near Keyser, on the Big Sandy division of the Chesapeake & Ohio Ry., on Jan. 1, 1919. This property consists of 3200 acres of high grade splint and gas coals, and is underlaid by five workable seams of coal aggregating 25 ft. in thickness. Mr. Hatcher is contemplating making further railroad extensions, and about 14 miles of grading is already completed. Eventually four miles will be opened on this property. Timber necessary for the construction of additional tipplers and other mine buildings is being cut from this same property. A double tipple is planned for mines Nos. 2 and 3. All mines will be electrically equipped throughout. It is planned to construct 100 modern miners' homes, twelve of which are already completed, also a three-story store and office building.

## KENTUCKY

**Bourbonville**—Three large coal companies are making extensive development in the Harlan field. They are the United States Coal and Coke Co., the Wisconsin Steel Co., subsidiary of the International Harvester Co., and the Black Mountain Coal Co., which is said to be one of the Peabody interests. These three concerns are developing approximately 200,000 acres of fine coal lands in that field.

## ALABAMA

**Birmingham**—Chief Mine Inspector C. H. Nesbitt has called a meeting of the board of examiners, to be held in his office in the Chamber of Commerce Building, Jan. 20 to 23 inclusive, for the examination of applicants for positions as mine foremen and firebosses. An unusually large class is expected, as this will be the first session of the board held since January, 1918, the meeting scheduled for July, 1918, having been passed to avoid any possible interference with coal production during the war.

## INDIANA

**Evansville**—A report from Evansville, Ind., Dec. 29, stated that an attempt had been made to destroy the plant of the Crescent Coal Mining Co., near Evansville, by setting fire to the washhouse. John Patterson, night watchman, attempted to turn in an alarm and was assaulted by an unknown man, who escaped.

## ILLINOIS

**Belleville**—The Beese Coal Co. has been incorporated by John Beese, Sr., John Beese, Jr., W. F. Hoehner, Charles Beese, W. G. Hoehner and C. A. Hoehner.

**Springfield**—Meetings of the Illinois State Mining Board will be held in January as follows: Jan. 9 and 10, at West Frankfort; 11, at Herrin; 13, at Belleville; 14, at Collinsville; 15, at Staunton; 16, at Springfield; 18, at Danville; 20, at Peoria; 21, at Canton.

**O'Fallon**—Six hundred miners in the so-called Nigger Hollow Mine No. 2 of the St. Louis & O'Fallon Coal Co. were temporarily thrown out of work when fire was discovered in one of the entries of the mine. Men were put to work immediately to wall in the fire. It is expected that the flames will be smothered without difficulty.

**Collinsville**—The new labor temple, erected by the four miners' unions of Collinsville at a cost of \$100,000, was dedicated on Sunday, Dec. 29. There was a parade and addresses by Thomas J. Reynolds, Illinois District Arbitrator of the United Mine Workers; Dan Thomas of O'Fallon, sub-district president; Frank Farrington, of Springfield, district president, and Frank J. Hayes, international president.

## KANSAS

**Scammon**—The Carbon Coal Co. No. 2 is completing what is said to be the largest stripping mine in Kansas. The operation is south of Scammon and is located on a 320-acre tract of land. The present equipment consists of one No. 225 Bucyrus shovel and one Bucyrus loading machine. Present capacity is 600 tons per day. Equipment will be doubled shortly and the output increased to 1200 tons daily. W. A. Patterson is president; R. A. Gray, vice-president, and W. C. Shank, secretary and treasurer. General offices of the company are at Pittsburg, Kan.

## Foreign News

**Merritt, B. C.**—At the Diamond Vale mine a tipple is being constructed in order to permit an early resumption of operations. The mine has been idle for some time.

**Vancouver, B. C.**—The International Coal and Coke Co., incorporated in the State of Washington, of which A. C. Flummefelt, of Vancouver, is president, will reincorporate in Canada in order to save double taxation. It is capitalized at \$3,000,000, and shareholders are being offered an even exchange of new for old shares, or 25c. in cash for shares of the par value of \$1.

**Nanaimo, B. C.**—The Granby Consolidated Mining, Smelting and Power Co., Ltd., has recently put into operation its new Marcus tipple at Cassidy. This company will also erect a large coal washery, to be built in connection with the tipple, for the finer sizes. Contract for the tipple equipment was placed with Roberts & Schaefer Co., of Chicago, who also have been awarded contract for the new washery equipment.

**Vancouver, B. C.**—It is reported that the use of powdered fuel by the B. C. Sugar Refinery has proved satisfactory and that, as a result, the Powell River Pulp and

Paper Co. and the Ocean Falls plant of the Pacific Mills, Ltd., are likely to adopt the same system. It is said that powdered fuel has been shown to be more economical than oil in this Province, and if the development suggested takes place there will be established an important additional market for the output of the coal mines of Vancouver Island, Merritt and Princeton.

**Ottawa, Ont.**—In order to enable the Nova Scotia Steel and Coal Co. to operate its submarine coal areas underlying Sydney harbor, which are only accessible through the intervening territory of the Dominion Coal Co., the Canadian Government has authorized them to enter upon and mine two portions of the Dominion company's leasehold, one about 4000 x 1000 ft. and the other about 8000 x 500 ft. The Nova Scotia Government is to receive the usual royalty of 12½c. per ton, and compensation is to be paid quarterly to the Dominion Coal Co., as the Government may determine. This action is taken under the powers conferred on the Government by the War Measures Act, on the recommendation of C. A. Magrath, as Director of Coal Mining Operations in Nova Scotia and New Brunswick. It is regarded as settling an important principle that operating mining companies cannot be deprived of access to their properties so long as payment is made for any trespass involved.

## Personals

**Lieut. J. R. Crowe, Jr.**, will shortly return to civil life and assume his former position as president of the J. R. Crowe Coal Mining Co., Kansas City, Mo.

**Kerr W. Rittenhouse**, who has been sales manager for the Central West Coal Co., Columbus, Ohio, for several years, has resigned to take a similar position with Consolidated Mining Co., also of Columbus.

**Willis H. Brown**, who has been out of the coal business for nearly a year because of illness, has opened an office on the 11th floor of No. 1 Broadway, New York City. He is well known to the trade, having been formerly connected with the Skeele Coal Co. and the Seiler-Rogers-Brown Co. He was a vice president of the latter concern.

**Wiley L. Byers**, general sales manager for the Producers' Coke Co., Uniontown, Penn., on Jan. 1, 1919, retired from active duty in that capacity after 6½ years of efficient service. During the war Mr. Byers has been assistant district representative and production manager of the Federal Fuel Administration, and was responsible in a very large measure for the wonderful record shown by the Connellsville coke region. Early in the spring Mr. Byers expects to enter business for himself, continuing in the coal and coke industry.

## Obituary

**Patrick Hogan**, general superintendent of the Big Creek Coal Co., Canton, Ill., died recently. He was formerly a state mine examiner.

**Louis Ray Kortkamp**, of the Kortkamp Coal Co., died at his home at Hillsboro, Ill., after a short illness. He was the son of Louis Kortkamp, who was killed in the Kortkamp mine two years ago.

**Robert L. Ralston**, a prominent coal operator of southeastern Kentucky, dropped dead in a drug store in Middlesboro, Ky., on the evening of Jan. 1, while waiting for the city papers to come in on a late train. Mr. Ralston and several friends were discussing coal and other conditions, when he suddenly reeled and fell before he could be caught. He died before medical aid reached him, death being due to heart trouble. Mr. Ralston is survived by a wife and six children.

## Coming Meetings

**American Wood Preservers' Association** will hold its annual meeting Jan. 28-29, 1919, at St. Louis, Mo. Secretary, F. J. Angier, Baltimore, Md.

**American Institute of Mining Engineers** will hold its 119th meeting Feb. 17-20, 1919, in the Engineering Societies' Building, New York City. Secretary, Bradley Stoughton, New York City.

**American Society of Civil Engineers** will hold its annual meeting Jan. 15-16, 1919, at the headquarters of the society, 33 West 39th Street, New York City. Secretary, C. W. Hunt, New York City.

## Recent Coal and Coke Patents

**Mining Machine**. E. C. Morgan, Morgan Park, Ill., 1,276,249. Aug. 20, 1918. Filed Aug. 15, 1910. Serial No. 577,134.

**Smoke Consuming Device for Fire Boxes**. W. D. Boyce, New York, 1,276,166. Aug. 20, 1918. Filed Jan. 22, 1917. Serial No. 143,756.

**Fuel Transmission Mechanism for Stokers**. N. McGee, Altoona, Penn., 1,276,642. Aug. 20, 1918. Filed Dec. 29, 1913. Serial No. 809,349.

**System of Mining Coal**. E. O'Toole, Gary, W. Va., 1,276,952. Aug. 27, 1918. Filed Mar. 16, 1914. Serial No. 824,979.

**Mining Drill**. J. A. Kaye, Salt Ste. Marie, Ontario, Can., 1,277,220. Aug. 27, 1918. Filed June 15, 1918. Serial No. 240,152.

**Ash Shifting Shovel**. C. F. Wiley, Columbus, Ohio, 1,277,279. Aug. 27, 1918. Filed July 5, 1917. Serial No. 178,716.

**Locomotive Ash Pan**. T. P. Madden, St. Louis, Mo., 1,277,972. Sept. 3, 1918. Filed Dec. 8, 1917. Serial No. 206,224.

**Calcinating Coal at High Temperatures**. W. Dyrssen, New York, N. Y., 1,277,707. Sept. 3, 1918. Filed May 27, 1918. Serial No. 236,866.

**Locomotive Stoker**. E. Pierce, W. Burlington, Iowa, 1,277,641. Sept. 3, 1918. Filed Aug. 14, 1914. Serial No. 856,630.

**Ash Pan**. A. T. Peterson, Mahtowa, Minn., 1,278,736. Sept. 10, 1918. Filed Mar. 20, 1918. Serial No. 223,618.

**Coupling for Mining Cars**. H. J. Williams, Nanticoke, Penn., 1,278,541. Sept. 10, 1918. Filed May 4, 1918. Serial No. 232,534.

## Publications Received

**Economic Operation of Steam Turbo-Electric Stations**. By C. T. Hirshfield and C. L. Karr. Department of the Interior, Bureau of Mines. Technical Paper 204. Unillustrated, pp. 29, 6 x 9 inches.

**Monthly Statement of Coal-Mine Fatalities in the United States, August, 1918**. Compiled by Albert H. Fay. Department of the Interior, Bureau of Mines. Unillustrated, pp. 27, 6 x 9 inches.

**Monthly Statement of Coal-Mine Fatalities in the United States, September, 1918**. Compiled by Albert H. Fay. Department of the Interior, Bureau of Mines. Unillustrated, pp. 29, 6 x 9 inches.

**Eighth Annual Report by the Director of the Bureau of Mines to the Secretary of the Interior**. For the fiscal year ended June 30, 1918. Department of the Interior, Bureau of Mines. Unillustrated, pp. 124, 6 x 9 inches.

**Production of Explosives in the United States During the Calendar Year 1917**. Compiled by Albert H. Fay. Department of the Interior, Bureau of Mines. Technical paper 192. Unillustrated, pp. 21, 6 x 9 inches.

**Methods for Routing Work in the Explosives Physical Laboratory of the Bureau of Mines**. By S. P. Howell and J. E. Tiffany. Department of the Interior, Bureau of Mines. Technical Paper 186. Unillustrated; 63 p.; 6 x 9 inches.

## Trade Catalogs

Copies of the catalogs, booklets and other literature listed below may be obtained free of charge by addressing the manufacturer.

**Draeger 1917 Model Breathing Apparatus**. Draeger Oxygen Apparatus Co., Pittsburgh, Penn. Two-color postcard folder illustrating and describing the new safety and comfort features of the latest model apparatus.

**Coal Mine Car Bearings**. Hyatt Roller Bearing Co., New York, N. Y. Bulletin 375. Pp. 12, 8½ x 11 in., illustrated. Outlines the engineering advantages of the use of Hyatt roller bearings in coal mine cars.

**Link-Belt Equipment for the Handling and Preparation of Coal at the Mine**. Link-Belt Co., Philadelphia, Penn. Book No. 333. Pp. 88, 6 x 9 in., illustrated. Describes coal tipplers, conveyors, washeries and other equipment used at the mines.

**American Ring Coal Crusher**. American Pulverizer Co., St. Louis, Mo. Pamphlet. Pp. four, 8½ x 11 in., illustrated. Describes a coal crusher that the manufacturer states uses less power and less labor than other like machines. The company guarantees the machine and takes all risks for wear and tear.

**Lidgerwood Steam Mine Hoists.** Lidgerwood Manufacturing Co., New York. Catalog. Pp. 32, 9 $\frac{1}{2}$  x 12 $\frac{1}{2}$  in., illustrated. Presents the company's standard lines of steam mine hoists, and also a few types developed to meet special conditions. General specifications are given and tables of sizes, etc., for the different types illustrated.

**C-H Mine Duty Self-Starters.** Cutler-Hammer Manufacturing Co., Milwaukee, Wis. Publication 408. Pp. 2, 8 $\frac{1}{2}$  x 11 in., illustrated. Leaflet describes two types of mine duty self-starters, and draws attention to the need of installing automatic motor starters of this type for controlling pump and fan motors. A C-H unit charging rack for miners' electric lamps is also illustrated.

**Miscellaneous Applications of Electrical Heat by Means of Standardized Units.** Cutler-Hammer Manufacturing Co., Milwaukee, Wis. Pamphlet. Pp. 4, 8 x 11 in., illustrated. Describes the C-H space heaters and makes special mention of the great variety of applications of these units. A blueprint accompanying the pamphlet gives all the dimensions of these standardized units.

**V. V. Fittings.** V. V. Fittings Co., Philadelphia, Penn. Catalog No. 21. Pp. 128, 8 $\frac{1}{2}$  x 11 in., illustrated. A beautifully printed catalog listing the company's conduit fittings and safety switches. The pictorial index, occupying the first 13 pages in the book, affords the user of the catalog at once a visual and descriptive aid of the article he seeks information about, and should prove a valuable feature to prospective buyers of equipment.

## Industrial News

**Cleveland, Ohio.**—The Valley Coal Co. has increased its capital from \$20,000 to \$50,000.

**Toledo, Ohio.**—The Rotal Elkhorn Coal Co. has increased its capital from \$25,000 to \$50,000.

**Ohio City, Penn.**—The Jim Run Coal Co. is preparing to erect some new bungalows at its mines near Ohio City.

**Lexington, Ky.**—The Barwick Coal Co. capital \$35,000, has filed amended articles increasing its capital to \$50,000.

**Indianapolis, Ind.**—The Panhandle Coal Co., of Indianapolis, has increased its capital stock from \$200,000 to \$400,000.

**Niles, Ohio.**—The Niles Fuel and Supply Co. has been chartered with a capital of \$10,000 by Charles H. Mason and others.

**Chavie, Ky.**—The Reckie Coal Co. has filed notice of an increase in its capital from \$10,000 to \$35,000, to provide for expansion.

**Tyrene, Ky.**—With a capital of \$6000, the Tyrene Coal Co., has been incorporated by Albert Ledrlöge, A. J. Nowling and A. M. Nowling.

**Pineville, Ky.**—The Indian Creek Coal Co. has filed notice of an increase in its capitalization from \$25,000 to \$50,000 to provide for expansion.

**Hazard, Ky.**—The Midland Mining Co. has filed notice of an increase in its capital from \$150,000 to \$190,000, for proposed extensions and expansion.

**Middlesboro, Ky.**—The Block Coal Co., Middlesboro, Ky., capital \$3000, has been incorporated by G. P. Sharp, James D. Yarborough and H. A. McCamy.

**Newark, Ohio.**—The Eagle Mining Co. has been chartered with a capital of \$10,000 by J. Howard Jones, Roderic Jones, Laura V. Sechrist, George Hayden and Ray Patterson.

**Canton, Ohio.**—The North Industry Coal Co. has been chartered with a capital of \$50,000 by E. J. Condon, John Fluera, Constantin Westemeen, Claude A. Volzer and Nick B. Alba.

**Philadelphia, Penn.**—The Atlantic Fuel Co., Fifty-second and Whitby Streets, has awarded a contract for the erection of a new one-story coal pocket at its works, about 30 x 125 feet.

**Farmersburg, Ind.**—The Barnhart Coal Co. has been incorporated with a capital of \$25,000 to engage in coal mining. The directors are Frank Barnhart, Norman W. Freeman and Daniel C. Voreis.

**Toledo, Ohio.**—The Nelsonville Coal Mining Co. has been chartered with a capital of \$25,000 by William H. Albrecht, Jr., John R. Calder, George E. Seney, O. S. Brumback and John M. Ormond.

**Regina, Ky.**—The Winston-Elkhorn Coal Co., capital \$200,000, D. R. Coleman, W. M. Coleman and others, plans large developments, operating four mines with shipping

facilities over the Chesapeake & Ohio Railroad.

**Columbus, Ohio.**—The Flint Coal Co. is the name of a new mining concern which has opened offices in the Columbus Savings and Trust Building with L. F. Bertram in charge. The operation is on the Baltimore & Ohio, near McArthur, Ohio.

**Philadelphia, Penn.**—The Government, Navy Department, has awarded a contract to the Wark Yardley Co., 1737 Filbert St., Philadelphia, for the construction of a new coal- and ash-handling plant at the League Island Navy Yard, to cost \$9435.

**Philadelphia, Penn.**—Walworth Manufacturing Co. has recently purchased the business of Hunter & Dickson Co., at 241-247 Arch St., and will operate it as one of its branches. The Walworth Manufacturing Co. manufactures valves and fittings for steam, water and gas work.

**Huntington, W. Va.**—The Vanbail Coal Co., 825 Fourth Avenue, recently perfected its organization, and is planning for the early development of approximately 600 acres of coal properties. It is proposed to have a daily capacity of 500 tons.

**Columbus, Ohio.**—The Hamilton Manufacturing Co. has installed one of its new stripping conveyors at the operation of the Vinton-Jackson Coal Co., in Vinton County, Ohio. This machine is the invention of William E. Hamilton of Columbus, and is reported to be doing good work.

**Louisville, Ky.**—The Seaboard Airline Railroad Co., which has been taking a considerable tonnage of eastern Kentucky coal, has cancelled all orders, being filled up with enough coal to last for several weeks. The Louisville & Nashville has also quit buying, and the Southern is almost filled up.

**Pittsburgh, Penn.**—The Producers Fuel Co. has been organized to handle the output of coal operators as exclusive selling agents. Executive offices have been opened in the First National Bank Building. Officers of the company are J. K. Barber, president; W. S. Buyers, vice-president; R. C. Masten, treasurer.

**Chattanooga, Tenn.**—The Raccoon Coal Co. has filed articles of incorporation with a capital of \$50,000 to develop coal properties in Wauhatchie Valley, near Kelly Ferry. It is proposed to install complete mining equipment, with a large new tipple. C. H. Huston, C. W. Howard and J. S. Fletcher head the company.

**Preston, W. Va.**—The Nethkin Coal Mining Co. has been incorporated with a capital of \$100,000 to develop extensive coal properties near Newburg. W. R. Nethkin, Cumberland, T. R. Nethkin, Buckhannon, C. H. Lantz, Piedmont, W. Va., and H. C. Thompson, Philadelphia, Penn., are interested in the new organization.

**Shenandoah, Penn.**—The Wentz interests, operators of mines at Upper Lehigh Hazle Brook, Midvalley and Maryd, have acquired a mine at Raven Run. D. B. Wentz, president of the Wentz companies, applied for a charter for the new company, which will be called the Raven Run Coal Co. The plant will be located near Shenandoah, Penn.

**Morgantown, W. Va.**—The Davis Fuel Co. announces that it has changed its corporate name to Fiedler-Davis Fuel Co. in order to avoid confusion with other firms and corporations that bore names similar to the discarded name of the company. The change became effective Jan. 1. There has been no change in the personnel, capital or policy of the company.

**New York, N. Y.**—Charles S. Allen, secretary of The Wholesale Coal Trade Association of New York, reports that the Coal Exchange recently opened by the association is meeting expectations. About 25 transactions have been consummated through the Exchange, ranging from a few cars to 5000 tons. The members of the association are urged to avail themselves of the facilities offered.

**Jeff, Ky.**—The Acup Creek Coal Co., recently incorporated with a capital of \$175,000, has been organized with Arthur L. Ware as president, John C. Eversole vice-president and Harry P. Jones, secretary-treasurer. The company is planning for the immediate installation of the necessary equipment for the development of about 2000 acres of coal properties, to have a capacity of about 1500 tons daily.

**Buffalo, N. Y.**—J. Fred Morlock reports that he has lately taken control of the mines of the Clarion & Allegheny, Pittsburgh & Allegheny and Cambria & Allegheny coal companies, in the Allegheny Valley and nearby districts. They have a total output of about 500 tons daily. The Cambria is a Lilly smelting variety. Mr.

Morlock also has some other mines in that vicinity, which he took over some months ago.

**Manchester, Ky.**—The Columbia-Panama Coal Co. has recently acquired title to a total of 1300 acres of coal properties in the Manchester section and is understood to be planning for early development. It is said that the company is planning for extensive improvements and additions at its properties north of Manchester, including the erection of machine and repair shops and a new power plant for operation. H. H. Hardinge, Chicago, Ill., is president.

**Buffalo, N. Y.**—The Donner-Union Coke Corporation has filed plans for the erection of a number of new additions to its plant, to provide for increased capacity, aggregating in cost a total of about \$300,000. Included in the structures are a new brick and steel product building, estimated to cost \$100,000; service building, brick and steel, to cost \$23,000; brick and steel machine shop, to cost \$17,000; and reinforced-concrete coal bin to cost about \$100,000, with auxiliary structures.

**Bourbonville, Ky.**—The Louisville & Nashville R.R. is preparing to construct about 50 miles of new line in southeastern Kentucky to open up large coal fields. It is also announced that the same company will double-track that portion of the Cumberland Valley division between Corbin and Pineville in order to expedite the movement of coal trains. A section of the Harlan branch will also be double-tracked. That portion extends from Pineville to Paige, a distance of 18 miles. Large yards will also be built at Nolan and Baxter in the Harlan field. Construction work will start in the near future.

**Dallas, Tex.**—The coal output for Oklahoma during the month of November amounted to 368,225 tons, according to a statement recently issued by P. A. Norris, State Fuel Administrator for the State of Oklahoma. This is 16,273 tons in excess of the output during November, 1917. Mr. Norris also gave statistics showing that the coal production in the States of Arkansas, Missouri and Kansas showed a decrease for November this year as compared with November of last year, but that Texas showed an increase of 36,101 tons. It was shown that local industries and domestic consumers absorbed the increased production in Oklahoma, the railroads demanding less fuel than a year ago.

**Clarksburg, W. Va.**—Open-top cars are no longer available for team-track operators who are loading from wagon mines, according to instructions received Saturday, Dec. 28, from the office of C. W. Van Horn, superintendent of the Monongah division. Eastern shipments may be resumed at once. The circular letter announcing this change reads as follows: "Cancel previous instructions and effective at once and continuing until further notice discontinue entirely permitting open-top cars to be loaded at wagon mines or team tracks with coal. Also cancel instructions prohibiting coal loaded by wagon mines at team tracks to go forward to points east of Grafton. Permit such shipments to go forward either east or west unless specifically covered by other embargoes."

**Jefferson City, Mo.**—A bill for a workmen's compensation law, proposed by the Missouri State Federation of Labor, was introduced at the opening of the State Legislature on Jan. 8. It provides for the creation and management by the state of a fund to furnish insurance under the law at cost. The proposed law would be elective and not compulsory. If both employer and employees accept it, the employer will be liable irrespective of negligence for accidents arising in the course of employment. The schedule of benefits provides that in addition to all other compensation an injured employee shall receive all necessary medical aid for the first eight weeks, not exceeding \$200, and in exceptional cases the commission may extend both of these limits. During temporary total disability the employee would receive two-thirds of his average wages until he is able to work again, but not longer than 400 weeks. During temporary partial disability he would receive two-thirds of his loss in wages until he is able to earn full wages again. For permanent total disability he would receive two-thirds of his average wage for the rest of his life. For permanent partial disability, after he is able to work again, the employee would receive two-thirds of his average wages for periods varying with the nature of the injury. If injury causes death, the employer must pay the reasonable burial expenses, not exceeding \$200, and total dependents would receive two-thirds of the average wages for 300 weeks to be immediately commuted and paid in a lump sum.

## MARKET DEPARTMENT

### Weekly Review

*Market Conditions Still Stagnant, With No Hope of Improvement in Near Future—Output of Soft Coal Shows Tremendous Drop—Coal Industry Hopeful for Coming Year—Anthracite Situation Well in Hand.*

**M**ARKET conditions continue to be hopelessly dull. The lack of even the slightest buying sentiment proves only too conclusively that industrial plants are stocked with coal to an unprecedented extent. Many in the trade prophesy that it will be weeks before buyers evince any eagerness to contract for their future requirements.

The production of soft coal has dropped considerably, owing to the observance of the Christmas and New Year holidays. Figures compiled for the week ended Dec. 28, 1918, show that the output of bituminous coal during this period was the lowest in three years. Only 6,385,000 net tons were mined, which is 3,746,000 net tons behind the production of the week ended Dec. 21, 1918, and 3,352,000 net tons lower than the output during the Christmas week of 1917. The total production of bituminous coal for the period Apr. 1 to Dec. 28, 1918, is esti-

mated at 447,748,000 net tons, an increase of 35,187,000 net tons over the output of the same period in 1917.

In spite of the falling off in production, shippers and dealers display no apprehension or uneasiness. Efforts at speeding up the miners during the war period resulted in an overstocked market the moment war industry ceased, and the net effect of the diminished output at this time will be to steady the market. Some little price cutting is reported, though the Government figures are being adhered to rather generally. The industry is looking forward to the entire elimination of Government control of coal, the consensus of opinion being that the regular channels of trade can now be depended on to take care of the country's needs.

No reports are at hand of a serious anthracite shortage anywhere, unlike the state of affairs at this time last year. In fact so favorable has the situation become that the Government

has signified its intention of relinquishing control of anthracite distribution in the near future. All restrictions on the use of the steam sizes of hard coal have already been removed, and this will doubtless help the movement of the egg and pea sizes, which are fast becoming a drug on the market. Stove and chestnut are still scarce, but even the proportion of these two anthracite coals will grow larger soon, as Government requisitions are being cancelled.

The observance of the Christmas holidays caused hard coal production to fall off more than a half million tons during the week ended Dec. 28. The total output of anthracite for the period Apr. 1 to Dec. 28, 1918, is estimated at 73,830,000 net tons, or 1,606,000 net tons below the output of the similar period in 1918. This tonnage is rather gratifying when it is remembered that the hard coal regions have been severely handicapped by a shortage of labor throughout the year.

#### WEEKLY COAL PRODUCTION

The lowest weekly production reported in the last three years was brought about by the time lost on account of the Christmas holidays during the week ended Dec. 28. Estimates for this week place production at 6,385,000 net tons, 3,746,000 net tons or 37 per cent. behind production of the week ended Dec. 21, and 3,352,000 net tons or 34 per cent. behind production of Christmas week of last year. The average daily production for the current week (five days) is estimated at 1,277,000 net tons as

Illinois in this place, assumed by West Virginia in 1908.

The loss of time brought about by the Christmas holidays caused anthracite production during the week of Dec. 28 to decrease more than a half million net tons, compared with the production of the week preceding, and was approximately 200,000 net tons lower than the production during the corresponding week of 1917. For the period Apr. 1 to Dec. 28, the production of anthracite is estimated at 73,830,000 net tons, which is 1,606,000 net tons or slightly over 2 per cent. below the production of a similar period of last year.

Carrriers' reports for the week ended Dec. 28 show tremendous decrease in loading in all districts, not only compared with the week of Dec. 21, but also with the week of Dec. 28, 1917. In central Pennsylvania, the decrease in cars loaded amounted to approximately 12,000; in Ohio, 7800; in the district including northeast Kentucky and southern West Virginia, 12,100; in Tennessee and Kentucky, 6400; in the district including Illinois, Indiana and western Kentucky, 9500; and in the district including Iowa, Texas and the southwest states, 4000.

Bituminous coal shipments to New England during the week of Dec. 28 are estimated at 242,443 net tons as compared with the previous week's shipments, amounting to 258,247 net tons. An increase occurred during the week in rail receipts while tidewater shipments decreased from all harbors.

Tidewater shipments decreased approximately 10 per cent. during the week of Dec. 28 and are estimated at 583,072 net tons. A decrease of approximately 20 per cent. or 78,000 net tons, occurred in shipments from New York and Philadelphia with a slight decrease in shipments from Baltimore. An increase of approximately 16,000 net tons or 8 per cent. occurred in shipments from Hampton Roads.

The production of beehive coke in the United States fell 130,000 net tons during the week of Dec. 28 compared with the week preceding, due generally to the loss of time on account of the Christmas holidays. The preliminary estimate places production during the week at 441,000 net

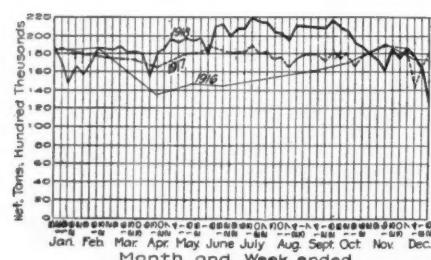
tons as against 567,000 net tons during the Christmas week of 1917. The plants of operators in the Connellsburg, Greensburg and Latrobe districts of Pennsylvania were operated during the week of Dec. 28 at 68.2 per cent. of their full time as compared with 73 per cent. during the week ended Dec. 21.

Byproduct coke production of the United States declined during the week of Dec. 28 approximately 16,000 net tons or 3 per cent. compared with the week preceding, and is estimated at 565,586 net tons. This production, however, exceeded that of the week of Dec. 28, 1917 by 136,722 net tons, or approximately 25 per cent. The limiting factor during the present week was lack of market in Pennsylvania. In addition, approximately one-quarter of the time of the Alabama ovens was lost on account of plant repairs. The plants of the country were operated during the week at 87.4 per cent. of their full time as compared with 89.4 per cent. during the week ended Dec. 21. The operators of the country were able to secure for the first time, during the week of Dec. 28, all the byproduct coal that was needed for their full time operation.

#### BUSINESS OPINIONS

**Marshall Field & Co.**—Current wholesale distribution of dry goods was less than for the corresponding week a year ago. Road sales for both immediate and future delivery also were less. Many buyers were in the market on Monday and Tuesday seeking merchandise for January sales. Summarizing holiday business, retailers report that the total was excellent. Collections are normal.

**Dry Goods Economist**—Unusual interest is shown in various lines of dress cottons, because of lack of confidence on the part of buyers in the ability of mills to supply appreciable quantities of wool or worsted dress goods for some time to come. The raw-cotton situation is unsettled. Domestic mills are not buying, and exports are less than had been expected. In the gray-goods market, reductions of from  $\frac{1}{2}$  to  $\frac{1}{4}$  cent per yard were made on some goods, while others advanced. The woolen goods situation is growing more acute.



compared with 1,913,000 net tons for this year to date and 1,763,000 net tons for the same period of 1917.

Total production of bituminous coal for the period Apr. 1 to Dec. 28 is estimated at 447,748,000 net tons as against 412,561,000 net tons during the period Apr. 1 to Dec. 28, 1917, or an increase of 35,187,000 net tons.

The production of bituminous coal and lignite in the calendar year 1918 is estimated at 585,883,000 net tons, an increase compared with 1917 of 34,092,000 net tons or 6.2 per cent. Four states reported decreases, Georgia, Iowa, Missouri and Texas. The most important increases were in Pennsylvania, 11,264,000 tons; Ohio, 5,715,000 tons; Illinois, 5,064,000 tons; and West Virginia, 4,908,000 tons. The estimates indicate that West Virginia still retains second place as a coal producer, but the lead is so small that final returns may place

**American Wool and Cotton Reporter**—That the wool market is more or less artificial is evident. Apparently every effort is being made to cancel the quantity of Australian wool which has been contracted for, but there is some question as to the ability of the Government to get out from under this contract, since it represents a good profit to the British Government, and it is understood that the British Government is not inclined to take back such a large amount of wool, when there is such a large oversupply on hand, and it may be hard to dispose of it. Cotton remains firm. There is a prospect that foreign countries will want cotton, which is a big factor in the strong situation. Another bullish factor is the fact that the present crop is the fourth short one in succession.

**Bradstreet's**—At the outset of the new year, following twelve months of record accomplishment, buying hesitates, skepticism as to the holding power of prices prevails, especially in the iron and steel industry, and inventorying still occupies attention; but, withal, advices as to potential demand for goods in general, at a price, of course, are rather liberally tintured with optimism. In the larger lines stocks are light, shipments on old sales together with those going forward to eke out broken lines are quite large, but in a broad sense slack-water conditions prevail. Incidentally, the government continues to readjust contractual obligations, while assuring traders that unwanted supplies will not be thrown on the markets, and that foreign fields are likely to be sufficiently needy to absorb quantities of such commodities as the government holds.

**The Iron Age**—In every quarter the question of the readjustment of contracts to the lower prices adopted two weeks ago by leading sellers is uppermost. Pig iron producers set out to hold to the old prices, but in the past week the calls upon them for the revision of contracts have grown in numbers and in urgency. Some furnace companies seem inclined to yield, while others strenuously insist that contracts be carried out as written. The falling off of foundry operations is a factor to which more consideration is being given, however, and the adoption of the lower basis for pig iron has found more favor than was indicated a week ago. That some blast furnaces will not long operate with \$3 taken from their market price is evident, and the readjustments in finished material will likewise impose some hard choices on high cost mills which must buy their raw materials in the market.

## Atlantic Seaboard

### BOSTON

**Market extremely dull. Steamers being tied up. Somewhat increased movement all-rail. Railroads stop taking coal. Mild weather and curtailment in manufacturing have effect. No sign of new contracts. Changes in trade. Government price shaded, but only small tonnage offering. Hampton Roads dumpings light for New England. Difficult to arrange disposition. No indication of reduced prices on smokeless coals. Georges Creek comes forward only for smelting. Restricted market from New York piers. Anthracite continues to improve. New England fuel authorities loosen their hold. Broken, egg and pea in surplus everywhere. Steam restrictions off. Stove and chestnut still hard to get.**

**Bituminous**—The New England situation continues practically without developments. The market is hopelessly dull and inquiry for any of the steam grades is practically nil. The accumulation is still so great throughout the territory that cancellations are general, and because it is next to impossible to replace these contracts the trade is suffering a very much reduced tonnage. Large plants which use up to 4000 or 5000 tons weekly are unwilling even to buy small lots at present prices. Buyers everywhere state their anxiety to get rid first of the inferior coal taken on during the rush in August and September. There have been so many cases of heating in storage that buyers are not to be blamed for their attitude.

An increasing number of steamers owned by the Emergency Fleet Corporation is being laid up in New England ports because of the lack of charters. All the rehandling factors have their trade so well filled up that there is only a very small outlet from week to week for such cargoes as arrive. In addition to that the Navy Department has more coal in storage here on private wharves than was ever known before, and this limits again the tonnage that can be absorbed by this market. The trade is much interested in what action the Shipping

Board will take on coastwise freights. The present rate of \$3.25 from Hampton Roads and \$3.50 from Baltimore has been in effect since April, and it will not be many weeks before the trade will insist that the authorities make some statement of policy. As it is, the differential over all-rail rates is so great that all the coastwise shippers will be seriously hampered in any effort to place coal on contract. The Shipping Board, of course, has the matter in its own hands, and nothing but public opinion can force any reduction in rates unless the authorities turn back to their owners a sufficient number of steamers to affect the freight market. It is rumored that some of the largest ships withdrawn from the trade last year will be returned within a few weeks. Meanwhile, it is likely that the Railroad Administration will interest itself in this phase for the reason that so much railroad fuel is brought by water from Baltimore and from Hampton Roads.

An increase the past week in movement all-rail is largely due to railroad fuel coming forward on purchases made a month or so ago. Only in scattered instances is there any increase in the movement of commercial coal. Low output is still characteristic of most of the operations in central Pennsylvania, and for a month or two no heavier shipments are looked for. As for the railroads, all buying has ceased and probably will not be resumed until the present large reserves are worked down. All the New England roads have had very light traffic the past two months, and to such extent is this true that the Boston & Maine, for instance, is using 1000 tons less per day than a year ago. Contract shipments by water have been stopped and the steamers diverted on other business.

Mild weather and the curtailment in manufacturing of all kinds are having their combined effect. The textile centers especially show the result of this, and the day is simply postponed when there will be any active buying interest in coal for next season. There is every indication that when buying is resumed there will be more discrimination as to quality and shippers than we have known for at least three years. Practically all Government requisitions through the several district representatives are now off, even for railroads and public buildings, and this will undoubtedly mean a new effort on the part of the shippers affected to place their coal in the open market. There are no signs of new contracts, however, and as yet there is no information what next season's price will be on high-grade coal.

The Government price has been shaded the past fortnight by shippers of medium grades; \$2.80@\$2.90 has been freely quoted for spot coal, but the tonnage has been small rather than large, and there are few traces of actual sales. The railroads would naturally be among the first to get these offers, and it is a commentary on the general situation that each time a price is heard it is 5c. or so less than the previous quotation. And this is at a time when most of the mines are on 30 to 40 per cent. output. So far the highest grades that are open to bunker pools have not been shaded.

Clearances from Hampton Roads for New England continue light. Disposition at this end is increasingly hard to arrange, and the agencies are making every effort to place their coal in other directions. Bunker business, of course, is most attractive, and all the shippers who can get such business have a wide margin on which to go and come, before there is any question of reducing the regular f.o.b. price for cargo coal. Bunkers will not take care of all the coal that will shortly be pressing for outlet, and either the export market will have to be enlarged or the mines will be forced to curtail. Nothing comprehensive in the way of business can be looked for from New England for months to come.

Notwithstanding the removal of zone restrictions all-rail, Georges Creek is not coming forward any more freely than before, when it was restricted to the water route. It becomes increasingly evident that this once popular grade will be available for this territory only for forge purposes. The past year or so the largest proportion has gone for naval and special Government use, and it is quite likely that this coal, which once had the call in New England, will practically disappear as one of the steam grades.

**Anthracite**—Shipments continue to improve both by rail and water, and there is now practically no anxiety in any direction over continuing supplies. The "independent" shippers are actively soliciting orders, and shipments that were impossible to get two or three months ago are now coming forward in considerable volume. Retailers are so much encouraged that they are cancelling orders previously on

file with such shippers, and for the balance of supply are looking to sources which they regard as more dependable in off seasons.

Mr. Storrow has announced that all active regulation on his part is now practically at an end. All but a few members of his staff have been dismissed, and except for clearing up loose ends there will be little done in his office from now on. His own resignation has been tendered to take effect at the pleasure of Dr. Garfield. "Emergency" coal has been reduced to five cars daily, effective Jan. 5, and it is likely that another week will see this movement discontinued. Four cars daily are being distributed in Maine and one car in Rhode Island. It is rumored that all allotments will be withdrawn by Jan. 15, and distribution will once more be in the hands of the regular shippers. There are now only a few cases where communities are seriously behind in their quotas, and these arrears can be promptly made up when the shippers themselves are left free to make deliveries at those points.

Broken, egg, and pea are in ample supply in most cities and towns. Stove and chestnut are still scarce, but the proportion has gradually increased as Government requisitions have been cancelled. In cargoes from New York ports the usual assortment now is egg, stove, chestnut and pea in about equal proportions.

It is understood that all restrictions on the use of anthracite for steam purposes are now taken off. This should help the movement of egg and pea sizes, which are fast becoming a drug on the market.

### NEW YORK

The anthracite market shows little activity. Dealers are well supplied and demand is slow. No serious trouble expected in providing for needs for balance of coal year. Orders for Independent coals cancelled. Anthracite steam coals plentiful, with prices easy. Good supply of bituminous on hand. Demand slow except for high grades. Trade marking time and buyers hesitate.

**Anthracite**—There has been little activity in the local market. Dealers are well supplied with coal and, because of the unseasonable temperatures until the early part of this week, consumption has been slow. The trade does not now look for any serious trouble in the way of supplies during the balance of the current coal year unless there should be transportation difficulties. Although production figures do not show any increase, but on the contrary the reverse, there is enough coal being shipped here to take care of the demands made on the dealers and to enable them to get ahead on certain sizes.

Producers and shippers of Independent coals are beginning to feel the effects of the continued mild winter, by the refusal of retail dealers to either accept deliveries of coal or to place orders for more. Dealers find it possible with the supplies they now have to secure sufficient tonnage through the larger producers and to save the 75c. per ton they must pay for Independent product. As a result it is probable that nothing short of a decided change in temperature can keep the market for individual coal from breaking. Consumers are so well supplied that they are now particular as to getting the size they prefer and are refusing to take any other.

There was a further decline in the dumpings at the local Tidewater docks during the week ended Jan. 3, a total of 5546 cars having been dumped as against 5691 cars the previous week. For December the reports show that 26,261 cars were dumped here, as compared with 21,891 cars in November, an increase of 4370 cars.

The quantity of the individual sizes of domestic coals the various shippers and dealers have on hand depends considerably on their trade. Egg is plentiful with most shippers, while stove and chestnut are tighter, but not scarce. This is caused by local conditions, certain sections of the Greater City using more of one size than another, the retail dealers being governed entirely by such conditions. Broken, pea and No. 1 buckwheat are long, more of the first named size being in dealers' yards than is usually the case in this market.

There has been little movement in the small coals. All sizes are accumulating rapidly and demand is small. Buckwheat is plentiful, some shippers being so well stocked that it is reported concessions are being made to move it. The same can be said regarding rice and barley. These coals have been purchased in larger quantities than has been the case under ordinary conditions, with the result that many retail dealers have large stocks on hand.

**Bituminous**—Lack of demand for the fair grades and a continued good demand for the higher grades of bituminous coal continues. This condition does not affect all producers and shippers, but is general.

The threatened strike among the marine workers, and which did result in several hundred workers stopping work for a few days, was one of the reasons why embargoes were placed on shipments at St. George and Port Reading late last week. There is an accumulation of coal at these two docks and movement has been slow.

Reports show an increase in the dumpings at the local docks for the week ending Jan. 3, 5451 cars having been handled as compared with 5128 cars the previous week. During last month 25,169 cars were dumped as compared with 24,582 cars the month of November. Receipts here are not expected to show any increase for the next couple of weeks. The mines have not recovered from the holiday season, and as the Greek churchdays are ahead, added to the scarcity of labor, the disinterestedness displayed by some workers, and the falling off in car supply on some roads, the prospects for increased shipments are not bright.

That New England is in good condition is borne out by the resignation of Fuel Administrator Storrow, announced on Saturday, Jan. 4. Mr. Storrow, according to reports, stated at the time that the situation both as regards hard and soft coal was now satisfactory and might be left to ordinary channels for the rest of the winter.

The removal of price restrictions and their effect on the market continue to be one of the chief topics of conversation among the trade. Shippers are not inclined to bind themselves to contracts and will not do so until they know the exact situation. Some of the trade look for the discontinuance of the zoning system this month, to be followed almost immediately if not at the same time, by the removal of the price regulations.

The pools containing coal suitable for bunkers are well stocked, but the demand is good while the keen competition among the small operators tends to keep the quotations where they were last week.

#### PHILADELPHIA

**Anthracite growing more plentiful. Moderate weather still holds back demand. All companies making good shipments. Individuals likely the first to be affected when market breaks, which seems imminent. Egg and pea draggy. Dealers showing signs of independence. Retailers start advertising. Bituminous well taken. Short production. Export business starting.**

**Anthracite**—It is known that some shippers and many retailers are actually wishing for severely cold weather. It is also developing that many hours of unnecessary work were devoted to figuring allotments and percentages of increases and reductions in tonnages as based on previous shipments to various dealers. This is convincingly proved by the fact that the largest shipping company feared to enter January orders for its numerous customers based on the tonnages due them. Knowing the condition of the market here, it deemed it advisable in order to avoid having refused coal on its hands to write all to whom coal is due, asking if it was their desire to have orders booked for their allotments. Naturally the rejections were few, for it will not be the big companies, with their prices 75c. or 95c. below the smaller houses, who will be the first to have their orders suspended.

The operators are showing signs of being pleased with their success in mining sufficient coal and in its distribution to all markets, notwithstanding the loss of about two million tons due to the epidemic. We have interviewed many buyers who are inclined to believe that the unusually mild weather to date has saved the situation and not the elaborate system of distribution, with its figures and percentages. It is also stated that tonnage lost through the idleness at the mines was in reality not necessary on account of the lack of severe weather.

Several of the largest shippers frankly admit the situation is causing them concern, while some of the smaller houses like to appear optimistic. To date we have been unable to find where they have been cutting into the differential, but anything is likely to happen, and we are watching for a genuine slump. A representative of one of the big companies reports that unless it soon grows cold and stays cold the whole system of distribution will go to smash and there will be a wild scramble for business. Surely the days of great activity in the Fuel Administration are numbered.

This week saw the demand for egg and pea continue to grow less. Aside from a few suburban dealers, the trade is well covered on egg, while pea is flat in all sections of the city. Some shippers report that most of their trade is even fairly comfortable on stove coal, but the demand for it is still good and very far in excess of that for egg and pea. For some reason

little chestnut, as compared to the other family sizes, has been coming here and we know many dealers who are extremely short of it. No dealer can be found who will say his trade will take coal regardless of size. Unlike a year ago, when the householders were grateful for coal of any size, they now insist on the size to which they are accustomed and will accept no other.

With coal getting easier dealers are already showing some signs of independence. They seem to realize that they may soon be again able to buy their coal where they want and not only where they did during the 1916-17 coal year. They are recalling that all shippers have not refunded the state tax for the last six months of 1915. While coal was so tight no one pressed his claim, but it has not been forgotten and the question is soon to be forcibly brought to the attention of some shippers when the time is more propitious.

The representative dealers are concerned as to how their smaller competitors will hold prices after the retail trade loses the controlling interest of the fuel authorities. They dread the return of price cutting with the devious methods of that practice. Just now they are greatly displeased with a suburban dealer who for some months received coal only through brokers and whose prices were correspondingly high. This week he received quite a substantial tonnage from one of the big companies, his entire quota for several months. Immediately he inserted an advertisement announcing in big type "Reduction in Prices." Although he was no lower than many of his competitors his "ad." was misleading and his method condemned. In this connection it is noticeable that an increasing number of retailers who formerly used newspaper space are again advertising. There is no mention of prices, most of them referring to service, and some others to the fact that they have all sizes of coal in stock.

When consulting one of the largest houses as to the status of the steam trade we were informed that the least said about it for publication the better. Unquestionably it is dull, and even the dealers who supply the small trade are complaining. The only desirable size is buckwheat, and we believe all shippers are able to dispose of their entire tonnage of this size; but the other sizes are becoming a greater problem with each day.

**Bituminous**—There is a firm demand for all coal coming into the market. Shippers continue to report only a moderate car supply and a shortened production due to the holidays which is making itself felt with full force at this time. The railroads continue to pile up reserve stocks of motive power fuel, which still causes much difficulty to supply the commercial demand for high grade fuels. There is no tendency to price recession, as coal continues in good demand, and this is especially so since there is some indication of foreign export business starting in good volume very shortly. It is understood that several foreign cargoes are already contracted for.

#### BALTIMORE

**New year begun with a number of problems yet to be solved but a plentiful supply of soft coal pouring in. Embargo necessary at times at Canton pier. Good run of hard coal with a decreasing demand. Not only real scarcity.**

**Bituminous**—The coal trade here is off on a new year with every feeling of confidence, although it is realized that many matters must be adjusted before a stable basis for trading is set. For the present there is a plentiful supply of coal pouring in. Indeed the rush was so great the past week that all the fuel was not absorbed promptly, and a brief embargo had to be placed against the Canton coal pier, where fuel from the Pennsylvania, Baltimore & Ohio and Western Maryland is concentrated under Government control for harbor delivery. Numerous industrial sidings also have been congested recently, and the railroads were busy urging more prompt unloadings.

Some industries, however, find that their coal supply is now running far ahead of their consumption under the reduced output incident to the close of the war. The fact that many industrial coal piles will last for weeks longer than was expected as a result of the coming of peace is also sharply reflected in orders for fuel.

Shipment of the less desirable coals is rapidly dwindling in the face of the release of better coals to the general market. Many representatives of coal mines are arriving here with offers of coal, but an encouraging feature is that none is talking of cutting the Government maximum.

As soon as the Government can release ship bottoms for the export trade and make

some readjustment for the protection of freight rates in competition with British shipping handling Welsh coals, a giant coal export is expected. Baltimore in 1915 reached a total of more than 2,000,000 tons on export bituminous, anthracite and coke combined, and if this can be resumed or bettered here and elsewhere excess production in this country can be readily handled.

**Anthracite**—The first real winter weather has come to this section. Weeks of mild temperature vastly cut consumption here. The end of the war has brought to an end the "fancy" salaries of many war workers. All of this is having an effect on the situation here, and the expected new demands for coal have not developed. With coal prices so high many are "mothering" fires to save coal and are hoping for an early spring to enable them to pull through on the original two-thirds delivered, or just being delivered, by their coal men. Not a few are now refusing to receive the remaining one-third of their orders. There is enough business still undelivered on the books of the two-thirds of absolutely needed coal, however, to keep the coal men busy for a time. All incoming fuel, and it is now liberal in supply, is rapidly absorbed. Egg and pea coal at times is probably a little too liberal in supply, but stove is short in spots and not hard to get. Buckwheat, which the public here never took kindly to as a domestic substitute for other sizes, even for mixing, is a drug on the market.

#### Lake Markets

##### PITTSBURGH

**Production still below normal. Steam coal fairly steady with gas coal strong.**

Coal production in the Pittsburgh district last week was well below normal and not much heavier than in Christmas week. There is now observable a tendency on the part of mine managements to allow their men to celebrate holidays as freely as they like, and in several cases mines have been closed entirely, partly as a contribution to the general market situation.

All observers agree that the Pittsburgh district is faring much better than other coal districts in connection with the general decrease in demand for coal and the tendency on the part of consumers to reduce their stocks. The weakness in steam coal is not pronounced, while gas coal is decidedly strong, rather than weak. Except for decidedly off grades, concessions on steam coal are usually confined to the allowance of brokerages of 10 or 15c. to dealers, who charge the consumer or retail dealer the full Government limit, but of course without the brokerage that the regulations permit the dealer to ask. In the case of gas coal brokerages are not usually allowed by the producer, and dealers have been able to effect sales without much difficulty at Government price plus brokerage.

There is an insistent demand for gas coal, and mine-run usually has to be taken, as the 3-in. being produced is absorbed by contracts, as is the slack resulting. The mine-run being sold in spot lots is chiefly from wagon mines. Some of the wagon mines producing steam coal have closed, but the gas coal wagon mines are still operating. As a rule they now secure only the Government limit, without the extra allowed for trucking. Government limits remain at \$2.10 for slack, \$2.35 for mine-run and \$2.60 for screened, per net ton at mine, Pittsburgh district, and the market may be quoted at Government limit to consumers for steam coal and at the Government limits up to the limit plus brokerage in the case of gas coal.

##### BUFFALO

**Bituminous very quiet. No prospect of early improvement. Jobbers still wait for a stir. Plenty of anthracite. Light consumption.**

**Bituminous**—The demand is still slack. Consumers no longer fear a shortage and are using up their surplus. Most of them have a heavy supply. They see in the big production a prospect of lower prices, but are not generally willing to buy on the offer of reduction. As a rule the sellers are not cutting the price, but it looks as if they would do so before long. New mines are sending representatives to this market, and they do not expect to do business on full prices.

Jobbers complain about as freely as they did when the operators had no coal to turn over to them. Now it is the consumer who has no use for them. Still they are much more hopeful than they were. When

the surplus in consumers' hands begins to disappear they will get business again. The railroads are buying pretty generally, but they refuse to pay any profit to the jobbers. This leaves the jobbers pretty nearly out, but this condition is not likely to last, for the consumers must have more coal soon.

**Anthracite**—The supply increases at such a rate that all uneasiness has disappeared. The prospect is that there will be plenty of hard coal in a few days, so that a retailer can go to a city trestle anywhere and get what he wants. This is a state of things that has not occurred in two or three years, and is quite different from what was feared even a month ago. The shortage has been overcome for the most part by an increase of supply. It is true that the consumption has been extremely light all the season so far, but there has also been a great shortage of natural gas, which has in part offset the extra amount of coal. It is not now believed that any amount of cold weather will be able to cause a further shortage this winter.

And now comes up the question of anthracite surplus. Already the independent shippers are finding it hard to sell their output, especially if it is not known to be of the very best quality. Few consumers will order it unless they need it urgently or are acquainted with the quality. It is predicted, even by the jobbers who handle independent anthracite, that it will go at a discount before long, mainly because the regular prices are so high.

#### CLEVELAND

Signs that some steam coal will be bought in January are becoming brighter. The movement is not expected to be large, but undoubtedly will prove quite sustaining in the present weak market. Holiday celebrations have cut heavily into production, a thing which is not now causing operators here any concern.

**Bituminous**—One large user of steam coal in the greater Cleveland district has directed the interest with which it has been doing its coal business to resume shipments, at the full Government price, on Jan. 10. Other industrial consumers are also showing activity, and many operators look forward to a brisk—in a comparative sense, of course—market by the latter part of the month. Stock piles have been well depleted by those interests that have not been taking any coal since the middle of November or thereabouts, and it is expected they will be forced into the market shortly.

For this reason, mainly, operators declare they are holding firm to the Government price schedule. Actuating this stand to a degree is the belief of some operators that quite a few steam-coal users quit buying soon after the armistice was signed to try to weaken the market. While some standard No. 8 coal may be bought here and there slightly under maximum prices, it doubtless is the case that an overwhelming percentage of standard coal has not been shaded. Stripping coal has been pretty well swept out of the market by the oversupply of standard No. 8 coal, and continued offers at 50 to 70c. off have not proved successful stimulants.

Cold weather has finally set in, and domestic demand has responded to this change. Retailers' business, however, still is only a fraction of normal, and a revival in earnest is no longer expected. Receipts both for industrial and commercial use have fallen in proportion, for holiday celebrations at the mines were severely felt. In most cases they were of two days' duration, but with the market as it now is, operators did not object.

**Anthracite**—Receipts are increasing somewhat, dealers formerly satisfied with five to six cars a week now being able to get eight and ten. Demand has improved slightly because of the coming of winter weather, but not much more than present receipts could be disposed of because of the large domestic stocks of bituminous.

#### DETROIT

Various conditions, prominent among which is an over-supply of stock on hand, contribute in creating an inactive market for bituminous coal in Detroit.

**Bituminous**—Business of jobbers and wholesalers in the Detroit market is pronounced far less satisfactory than is usual at this season of the year. Their efforts to interest buyers of steam coal and retail dealers in the product of West Virginia and Ohio mines, which has again become available, is disclosing that quite a number of the buyers believe they are already holding more coal than they should.

Other causes tending to diminish the volume of buying in the local market in the closing week of the year include the general reduction of industrial activity that comes with the period for taking an annual

inventory. To this may be added the cutting down of operations following the cancellations of numerous Government contracts for supplies for war purposes; the holding back of settlements on such contracts and the difficulties some manufacturers are meeting in trying to get materials they need to replace their plants on a peace basis of operation.

The stocks that some of the retailers and steam plants seem to find burdensome are said to include quite an amount of the coal from Indiana and Illinois, which was sent into the local market in large amount during the late summer and was bought because of the uncertainty that then seemed to obscure the outlook as regards ability of the buyers to get more desirable stock. The comparatively warm weather through November and December prevented the materializing of the expected retail demand.

**Anthracite**—Though not very much anthracite is coming into Detroit, the weather so far has been favorable to light consumption and dealers have not been subjected to any considerable degree of urgent demand from domestic consumers. The pressure for anthracite is also being relieved to a noticeable extent by a more plentiful supply of coke and by the fact that household consumers are now permitted to use coke to the full limit of their fuel requirements, although, in the case of anthracite, they are still required to provide a supply of bituminous equal to one-half of their fuel needs. The fuel administration has announced that the maximum price for coke delivery anywhere in Michigan will be \$10.75 a ton.

#### COLUMBUS

Coal trade in Ohio still rather quiet, but there are signs of revival of interest. Domestic trade is stimulated by colder weather. The steam business is dull, as consumers generally are overstocked. Prices are fairly well maintained.

Because of the fact that most steam users are heavily overstocked with fuel, there is little steam trade in Ohio territory. Consumers are loath to buy under present conditions, and they are following the policy of using up their reserve stocks. Railroads are not using as large a tonnage as formerly, and in addition there is a movement on the part of the purchasing department to hold off in the hopes of beating down the price. Consequently, current business in steam grades is not large. Quite a few of the users who cancelled orders several weeks ago are asking that they be reinstated, showing a better feeling in steam circles. But on the whole the steam trade is quiet and not a great deal is expected for some time. Michigan is fairly well stocked up, and the same is true of the manufacturing localities in northern Ohio.

The domestic trade is slightly more active, due to lower temperatures which have prevailed. Retailers have been fairly busy in the past few days making deliveries, but the activity in domestic grades is not long enough to have it reflected to any great extent on the operating end. Retail stocks are fairly large, and consequently dealers are inclined to use up reserves. There is a fairly good demand for Pocahontas and other fancy grades. Prices in the retail trade are generally well maintained, but there is some shading on the part of certain dealers. This is not sufficient to demoralize the market, however. Retailers look for a better demand when the expected cold wave arrives. The season so far has been unusually open.

#### CINCINNATI

Colder weather has stimulated consumption somewhat, but supply is much in excess of the demand and consumers' stocks seem ample for the rest of the season.

Business among the coal trade in this section remains almost wholly under the influence of the heavy stocks of fuel which were stored by both industrial and domestic consumers in preparation for the current season, coupled with the comparatively small consumption, especially of steam fuel.

The quiet of the reconstruction period is prevailing with the manufacturers, many of whom have greatly curtailed production as a result of the cancellation of war orders, while others have closed down completely, for the purpose of changing their plants back from a war to a peace basis. The net result is that industrial activity, aside from the normal year-end and holiday quiet, is less than at any time in the past two or three years. Moreover, the remarkably mild weather so far experienced, broken as it was at Christmas by a light snow, and by colder weather just now, has made the consumption of fuel for heating purposes much less than normal.

and stocks laid in for the winter have been reduced very little.

Present indications are that unless the remainder of January and the following winter months bring a sustained period of cold weather, consumers in all classes will carry over considerable stocks of fuel. However, indications are also favorable to cold weather, at least during the current month, to help consume the stocks on hand and thus prepare the way for a good spring season. The resumption of industrial activity in many lines is also looked for, with a corresponding increase in the use of fuel for steam purposes.

#### LOUISVILLE

Drop in temperature improves demand from small steam plants. Domestic demand quiet. Industrial demand fair only. Market slightly firmer.

Since Jan. 1 cold weather has about doubled the consumption of small steam plants in office buildings, central stations, etc., and has made things slightly more active for the retailer. However, domestic demand is not increasing materially, as consumers were well stocked and for the early fall and winter used coal considerably under expected requirements. The general steam demand is dull, due to the fact that industrial consumers are not especially busy. Coal is generally plentiful, and yards and bins are well stocked. Some river coal is now coming in and much larger shipments are expected within a few days.

Things at the mines show little improvement. Most of the mines are getting back into the running again after being down for the holidays, but some are not turning a wheel until a larger volume of business is booked. In several sections the mines have considerable coal in box cars and are trying to find a market for it. However, there is little unsold coal in transit.

Except for the small production of the past few weeks and the holiday shutdown, it is believed that the market would have broken sharply. However, reduced production has strengthened the market all around. Retailers are holding prices firmly. There is some coal being offered at mines at prices slightly under Government maximum quotations. However, this is mainly in connection with small mines and wagon mines, although a few producers are absorbing brokerage.

There has been a better demand for railroad coal during the past month than for some time past. Several of the Eastern and Southern roads have been buying freely. However, several of these are now loaded up, and by Jan. 15 it is claimed that the railroads will be fully stocked and this market cut off.

Excellent boating stages in the Ohio River are expected to result in considerable coal coming South. One local concern received ten barges a few days ago, which is the best shipment of river coal received in many months. More river coal would be moving except for the fact that river coal companies are still heavily stocked on rail coal. However, with a high river stage, free of ice, indications are that big operators will carry coal South on the rise, and await a market for it.

#### BIRMINGHAM

Domestic coal unusually scarce and demand heavy. Inquiries for steam coal good, but not specially insistent. Production took a big slump around the holidays.

Inquiries for domestic coal are especially strong at this time, both locally and from points throughout this zone, reports indicating a shortage at most all the chief consuming centers. Local dealers have little coal on hand and are unable to secure tonnage requisite to their requirements.

While steam-coal users were unable to stock much coal to carry them over the holidays in view of the restricted production which has been the order for the last month or six weeks, inquiries are not as strong as might have been expected. However, ample business is being booked to absorb fully the tonnage now being produced. Shortage of stocks is more manifest with the railroads than any other class of consumers, receipts and consumption running on a close parity with some of the lines.

#### Coke

**CONNELLSVILLE**  
Coke scarcity increased. Operators show some indifference in matter of production. Furnaces indisposed to pay advances in event of Government control being relinquished. Market lower for screenings.

Coke has become extremely scarce, blast furnaces having felt for the past ten days the effect of the sharp decrease in Connellsville coke production and in shipments of byproduct coal that occurred during Christmas week. Several blast furnaces have been forced to bank, while many others are operating at reduced rates in hope of avoiding banking. Last week's production was not much heavier than that in Christmas week.

Many coke operators seem disposed to allow or even encourage their men to celebrate holidays whether on the calendar or not, and the Greek church holidays occur this week on account of the difference in the calendar. Evidently it is felt that reduced output of coke will prove an advantage to coke producers in the long run.

There are no prospects of an early removal of Government price restrictions, and while predictions have been made that if the control were removed when coke is as scarce as at present the market price would advance sharply, second thought indicates that the blast furnaces would hardly bid against each other for coke as they have sometimes done in the past, but would rather be disposed to bank.

Last week the blast furnaces generally reduced their pig iron prices \$3 a ton, tardily following the program of price readjustment that had been mapped out by the American Iron and Steel Institute Committee for presentation to the War Industries Board Dec. 11. While the board did not receive the recommendations, they were given publicity and have had some standing. Having reduced their product \$3 a ton the blast furnaces would hardly be disposed to pay any fancy prices for coke in the open market. The market is quoted at Government limits on furnace and foundry: Furnace, \$6; foundry, 72-hour selected, \$7, per net ton at oven. Crushed, over 3-in., is nominally held at the Government limit of \$7.30, but there is little being done. Clean screenings from old dumps over 3-in., on which the Government limit is \$5.50, no longer bring that price, and \$5.25 is not easily obtained. As dealers who stocked up in anticipation of good demand for this material for domestic use have found their stocks move very slowly.

**Buffalo**—The situation grows easier, especially as the coal supply is no longer short. Besides, the output of pig iron has succeeded the demand of late, and the furnaces are not crowded. A Buffalo furnace owner is reported to have said within the past week that he had shut down one furnace and would follow with more if the iron sales did not pick up, for he was not going to stock up on this outlook. He was sure that prices would be easier soon. All this reduces the consumption of coke, so that the demand is quite moderate. Off grades are not selling well, but best quality is fairly active. Fuel coke is quiet, on account of the slackness of the coal trade.

## Middle Western

### GENERAL REVIEW

Brief storm followed by cold spell did not help coal situation as much as was expected. Tonnage decreasing. Coal carrying equipments not in demand at mines. Operators believe export of coal would help.

The Middle West recently received its first touch of winter. The storm that swept over the territory lasted two days, and was serious enough to hamper traffic to a small extent. This was followed by cold weather, which was of short duration, the temperature having climbed upward steadily for the last few days. The weather man predicts a storm on its way from the Rocky Mountains in the Northwest, which will affect our territory, including the Ohio Valley. Last week's blizzard proved one thing to the satisfaction of the coal man, and that is the present situation is beyond any substantial help from ordinarily favorable weather conditions. There was scarcely any noticeable difference in the market after the storm. Of course, it cannot be denied that the prolonged cold weather will have a beneficial effect on the market, but this effect will not be as great as previously hoped for by the coal operator.

A sharp decrease in tonnage continues, both for Illinois and Indiana, and in our opinion no improvement is to be looked for until perhaps the middle of February, or later. The coal-consuming public are seizing on the present weak market to dispose of their stored coal, and developments have shown that much more coal has been held in reserve than heretofore suspected, with the result that the public will not come into the market in any great force until some six to ten weeks hence.

The operators are facing the present condition with an admirable spirit. They have

seen that very little, if anything, is to be gained by price cutting, and they have made up their minds to let their mines remain idle, rather than operate on a basis below the present Government price, and consequently at a loss.

It is a very unusual thing, at this time of the year, to note long strings of empty coal-carrying equipment in the various railroad yards, but the fact of the matter is that the yards in Chicago are practically cluttered up with strings of empty coal cars, which have not been sent down to the operating fields because there is no demand for them.

One of the problems that the Illinois and Indiana operators are engaged in solving at this time is the question of whether or not all coals will continue to be sold on the basis of Government price. It is generally known that there are a great many qualities of coal coming from both of the states mentioned, and an operator cannot expect the public to pay the same price for an inferior product that they would pay for the best coal that the state has to offer. The operators will have to adjust this question themselves, and, of course, the poorer grade products will have to be marked down from the Government price. In our opinion, this matter is a question for the coal operators' associations in the different producing districts of Illinois and Indiana, and is a question that should be handled and settled at as early a date as possible, in order that the market may the more readily adjust itself to new conditions.

The Western operators are looking at the situation in the Eastern coal fields with a great deal of interest, as they feel that if any immediate relief is to come, it will be through the East. The feeling is that there is a great demand for coal in Europe and South America. In fact, the press contains numerous mentions of the fact that coal is selling on those two continents at from \$60 to \$120 per ton. The coal operators feel that if the proper authorities took the matter in hand, and exported coal to these countries, that the situation in the United States would be relieved to some extent. Of course, this would take time, but the sooner it is undertaken and got under way the better. The general opinion in the West is that if any relief is to be looked for, it will have to come from our exporting activities.

If a substantial tonnage was exported it would keep Eastern coal out of Indiana and Michigan, and thus allow the Western coal to resume the place it had in Indiana and Michigan before the signing of the armistice.

### CHICAGO

Domestic consumers seem to be stocked with coal. Large operation works only two days a week. Railroad buying a little more active.

There is practically no demand for domestic coal in the city. The recent storm, if it did nothing else, brought to light the fact that the average householder has a good supply of coal in his cellar, and is not a bit nervous about the prospects of a serious spell of cold weather. A look into the average dealer's yard showed no signs of extra activity; in fact, business was carried on just as sluggishly during and after the storm as it was before.

Some of the higher grade products of Franklin County suffered on account of this lack of market in Chicago. In fact, we understand that one of the biggest mines in the field, with a production of over 4000 tons per day, has only run two days in the last two weeks. This fact will give a general idea of the situation in Chicago.

There is some buying of steam coal, but not enough to make itself felt in any degree. The railroads are coming into the market a little more generally than they have heretofore, but are not making any purchases, merely giving instructions to renew shipments on orders previously placed.

### MILWAUKEE

Order reducing the price of byproduct coke is rescinded. Mild weather slows up consumption and makes the outward movement slow. Solicitation renewed.

The reduction in the price of byproduct coke to \$11.50, announced by the Fuel Administration last week, did not stand long, and this class of fuel is now retailing at \$12.25, except pea size, which is listed at \$10.25. There is no extra charge for delivery into bins, however. The reversal of the order reducing coke was brought about by the producers, who brought influence and argument to bear upon the administration.

A continuation of mild weather has a depressing effect upon the trade, and it is reasonably certain that a sudden with-

drawal of price regulation would precipitate a slump in soft coal, as holders of eastern bituminous are meeting with increasing competition from western producers. Last year at this time there were no agents on the road, and orders were accepted subject to regulation as to delivery and price. Now dock companies are soliciting business.

It is an assured fact that there will be no coal famine. The last run of hard coal by lake helped out wonderfully, and under present weather conditions and with supplies coming daily by rail, there will be enough hard coal for those who are unable to burn bituminous. The rule allowing two-thirds of last year's supply to consumers with magazine heaters or hot-air furnaces, and one-third to those with steam or hot-water plants, is being adhered to.

There is no trouble in securing cars for rail shipments this year, and absence of deep snow makes rail hauling steady and more reliable.

### ST. LOUIS

A slow and heavy market with a better tone at the end of the week and indications for better conditions. Steam demand is easy but domestic demand shows improvement. Surplus of all grades and sizes of coal. Transportation fairly good.

Expressions on the local situation are optimistic. The present winter has been the mildest since 1877. Up to the first of January there was not what might be called one cold day in the season. On the first of the year the weather got cold and at the end of the week it was below zero.

There has been a good supply of coal in storage, but this has affected the market only to a small extent. Here and there, however, are little indications of what is to be expected if seasonable weather continues. The steam demand everywhere still continues light. There is a little buying, but the storage piles are receiving the most attention. Some of these piles have been on fire and they are being gradually cleaned out, the consumer purchasing just enough coal on the open market to mix with the storage coal to help the general situation. The domestic demand with the first of the year picked up, and retailers everywhere are optimistic as regards the future. The demand, however, has not been sufficient to create any great change in the wholesale prices. Standard coal is still heavy, and many mines are idle on account of their failure to move the screenings. The railroad buying has been light, but it is expected that the new year will bring in considerable railroad business. This will help the screening situation.

The country demand for Standard is easy. Cars are plentiful and there are no labor troubles nor anything out of the ordinary other than lack of business to keep the mines going. The domestic demand for Standard is not good, the call being for the higher grades.

The Mt. Olive situation continues to be the most satisfactory. There are plenty of cars, mines are working on rather good time, and although there is some coal unburned, it is not in sufficient quantities to cause any worry. These prices are holding up to practically the Government maximum, whereas the Standard 2-in. lump is down to as low as \$1.50 to \$1.75, screenings as low as \$1.30 to \$1.50, mine-run \$1.65 to \$1.70, and 6-in. lump from \$1.75 to \$2. The domestic demand is fairly good for the Mt. Olive grade, although steam in St. Louis proper does not call for much of this coal. The steam demand is farther north, and in the country.

Conditions in the Carterville field show considerable improvement. Cars are not as plentiful as they might be, but there is an oversupply of them for some mines that are idle on account of no business. This affects the Williamson County field more than it does Franklin County.

There is a plentiful supply of this coal coming in right now, but nothing to indicate that it will continue to come in if extreme weather grips the northern territory for any length of time. Then this coal would be diverted north. There is, however, a fairly good supply of this coal in storage by the retailers, and such steam users as have been able to get it are fairly well supplied. This coal practically holds to the Government maximum, although screenings are in some quarters long and in other sections are short.

For the first time in many months some anthracite buckwheat was offered on the St. Louis market but found no takers. There is a little Arkansas anthracite and smokeless coal coming in, but not in any great quantities. In a general way the market shows some improvement, and the coming week will probably develop better prices on Standard coals, with also a possibility of higher prices for retail, which are now below the figure fixed by the St. Louis Fuel Committee.